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THE

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AND

NAVAL JOURNAL.

MONTHLY.

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Vol. IV.] APRIL, 1856. No. 1.

FOURTH VOLUME OF THE UNITED STATES NAUTICAL MAGAZINE AND NAVAL JOURNAL.

WITH the present number commences our Fourth Volume, and we desire to take a new "departure" in the reckoning of our voyage on the agitated sea of publication. We trust it will ever be gratifying to our friends to learn that all goes well with us; that a full allowance and a healthy crew promise good success in reaching the objects of our cruise. The gales of fortune have been close, but our ship is tight and strong—our rig adapted to the model and the voyage. Although we have but just entered the "*trades*" and the "*brave west winds*" of commerce, it has been our fortune to escape the "doldrums" and the "horse latitudes," as well as the hurricanes and tornadoes which have frequently crippled, foundered, or wrecked many a fair-weather voyager on the sea of public favor. We return thanks to our patrons, and indulge the hope that our present relations rest on a basis of mutual esteem and profit, such as shall never be shaken, but be multiplied a thousand fold in our successive volumes. It is never our purpose to write exclusively of the past; our vision is ever forward, as the flight of an eagle, and we would contend for the prize with equal vigor and determination.

We design to make this Magazine the *flag-ship* of all that pertains to the ship and the sea, and to this end we shall constantly devote our best efforts. But without the expressed approbation of our friends, and their lively interest on many occasions, the extension of our circulation and utility must necessarily be retarded.

On the receipt of this number, many of our patrons will render their favors—Will not a friend's favor accompany them? We trust that such will be the case, for each may have a friend *whose* friend may perhaps

desire, stronger than either, to enlist with us in a mutual advantage, which will redound to the benefit of a common interest.

Beginning with the present volume, we shall make a new division in our Table of Contents for the benefit of APPRENTICES, and shall for it open our pages to the *details* of Mechanism, Engineering, Navigation, and Merchandise.

The advancement of every art and science is developed in the *press*, and in the order of things the ship and her interests here stand forth in delineation and detail.

Our field of labor is ample—reapers abundant, and this our *garner* shall keep pace with American Commerce—the commerce of the globe—and its protection the Navy, the world over. With this end in view, we shall constantly work out the necessity for scientific principles in the construction, equipment, and propulsion of ships for whatever purpose. In taking this means to accomplish our design, we have not relinquished the exploration of other channels of business, to which we have been educated and hitherto devoted our lives, in the vain expectation of promoting our private fortune. The ship-yard and the ship would have furnished us tangible evidence of the value of our labors. We have ventured forth as volunteers to advocate the literature, science, and spirit of progress which in this age honor the men of Ship-building, Navigation, and Commerce. And it will ever be regarded as within our province to show such defects in our ships, whether Merchant or Naval, as have too long been the fruitful source of misery, disaster, and death; while it shall be no less our pleasure than our privilege to suggest such improvements as will have a tendency to make the *ship*, whether sailing or steaming, an honor to the age, and a blessing to mankind. Our commerce, already the largest on the globe, demands the best efforts of the press. The fearfully long and increasing list of shipwrecks admonish us that the Ocean should no longer be regarded as a watery waste; and with no greater degree of propriety should the ship be regarded as *a* "*floating warehouse.*"

Confident in the present and future usefulness of the U. S. NAUTICAL MAGAZINE AND NAVAL JOURNAL, we appeal to the maratime public and to the Navy of the United States for a generous support.

CLIPPER SHIP COMET.

WHILE we have labored abroad in distant parts of the United States, and even beyond its boundaries, in our efforts to form a Chart of the progress of Nautical Mechanism, it will doubtless not be assumed that there are not a few vessels, at least, belonging to the Metropolis of Commerce whose performance entitle them to an elevated position in the annals of fame. We have preferred that our neighbors should be served first, but we are admonished that we should not forget to be *just.* We are not now disposed to crowd out our friends, more than we have been, but while they are preparing their architectural dress for the pages of the *Magazine,* we have supplied their place with the spar-draft calculations and log of the clipper-ship *Comet,* a vessel which has made five voyages to San Francisco, averaging 100 days. This vessel was built by Mr. William H. Webb, whose reputation as a ship-builder is commensurate with the construction of over 100 vessels, and yet he is in the prime of life.

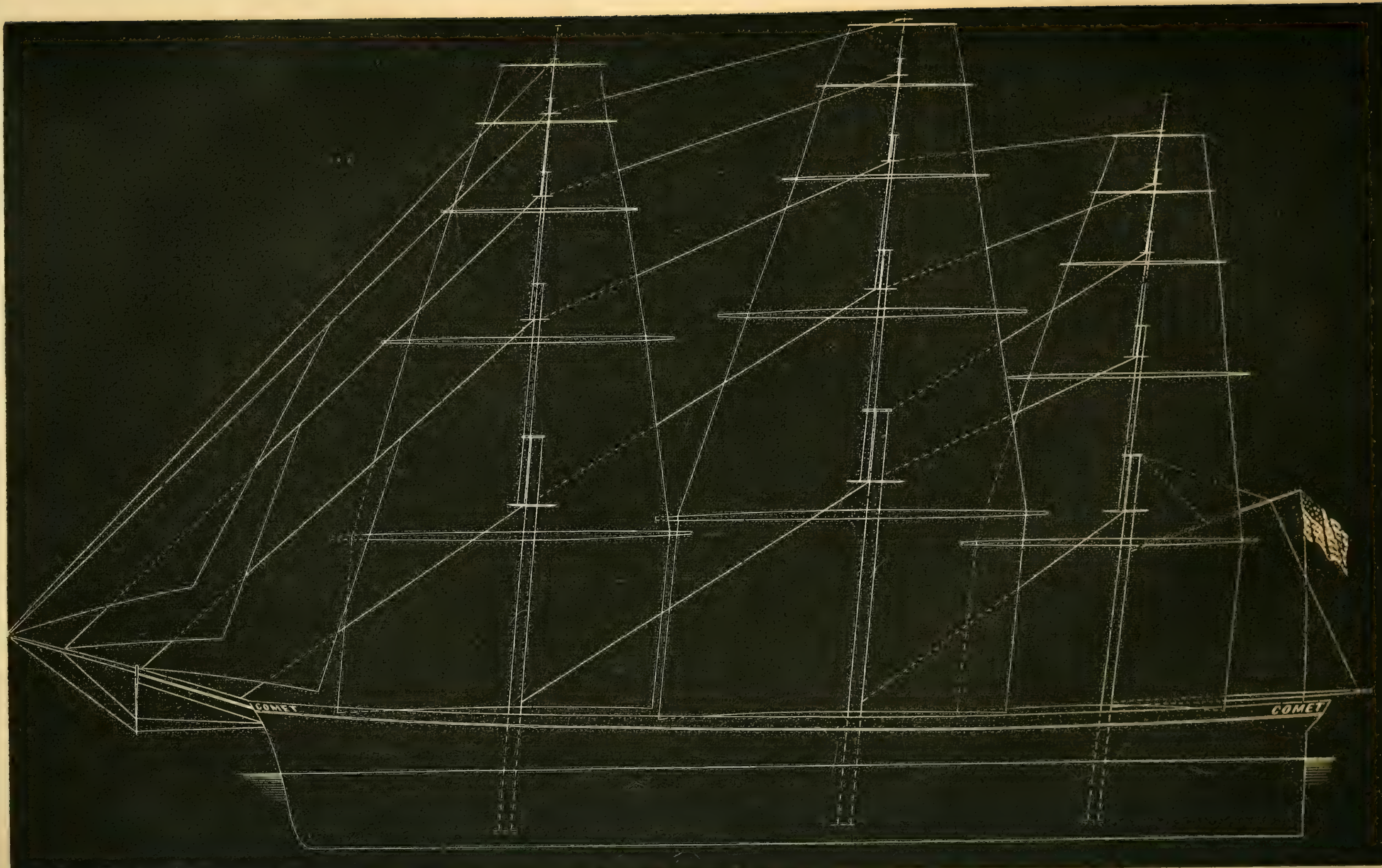
Inasmuch as ships, like men, may be best known by what they have done, we shall allow the Comet to speak for herself, after introducing her as the subject of a special notice by Lieutenant Maury, in his report to the Hon. Secretary of the Navy. He writes as follows: "The clipper ship Comet, E. C. Gardiner, is one of the vessels that is co-operating with us in the plan of observation for the wind and current chart. She has just performed a famous run from California to New-York. It is the shortest thence on record at this office, and the abstract log has been received. I beg leave to make it the subject of a special report." That combination of wind and sea on the polar side of the parallel of 45° south, which enables clipper-ships to run down their easting with such astonishing speed, is not to be expected along a route like this, which crosses and re-crosses the whole system of trade winds and calm belts of the ocean; nevertheless, the thirty-fifth day out from San Francisco this ship had crossed five of these belts, made 68° of longitude, and 95° of latitude, and doubled Cape Horn. During the voyage she was six days in calm and light, baffling winds, making on the average, during these six days, only 2.8 knots per hour. Her greatest speed for any one day was 371 statute miles—320 knots. From the heads at San Francisco to the bar at Sandy Hook she was 76 days. Deducting for the six days of calm and baffling winds, she ran for the 70 days, on an average, 205 miles (knots) per day. This is more than steamships on a long voyage (as from England to the Cape of Good Hope) usually make. Great skill and judgment appear to have been displayed in the management of this ship.

CALCULATIONS.

Her dimensions are as follows :—

	Feet.	Inches
Length on deck from perpendicular at rabbet of stem to perpendicular at rabbet of post at planksheer height	225	75
Breadth moulded at 18 feet from base	40	96
Depth from base-line to planksheer height	24	46
Depth of hold	22	17
Location of dead flat frame aft of forward perpendicular	93	75
Area of dead flat frame immersed (18 feet)	621	2
Moulded displacement in cubic feet	89,442	
Centre of gravity below 18 ft. line	7	54
Centre of gravity aft of forward perpendicular	111	9
Meta centre above centre of gravity	16	1
Register tonnage	1,836 tons	
Cargo capacity by dead weight or displacement at 21½ feet draught-water	2,222.6 tons gross	

It will be seen by the displacement, or the actual weight of her cargo, that she is a fair carrying vessel; and it may be a matter of surprise, to what, beside the model, her carrying properties should be attributed, to which inquiry we may with much propriety remark, that they are consequent upon a proper regard to the distribution of the materials—whatever was deemed necessary for strength and utility was furnished, and no more; by such distribution, the enormous burden of ships which is so often carried, to the great disadvantage of vessel and crew, was returnable in profits, as well as safety to life and limb. This is too often lost sight of when building vessels. Ship-builders as well as ship-owners forget that by giving the ship a large frame they weaken rather than strengthen the vessel, while by increasing the size or thickness of the planking they render the vessel more buoyant, and at the same time increase the profits as well as the strength of the ship. And the reason why clipper-ships have not generally been more profitable, was not because they were too sharp, but because they were too weak; or, in other words, they were partly loaded with ship, too much like a man whose appetite at dinner gets the better of his judgment; hence the reason why clipper-ships have damaged so many cargoes. Small frames, well plated, would have shown different results, as this vessel has proved. That the model and arrangement of propulsory power had much to do with her success, is abundantly manifest by an analysis of her calculations, and by reference to her log. We have rarely found the concentration of forces so well distributed as in this vessel.


COMET
COMET

An Abstract Log of Ship COMET, Capt. E. C. GARDINER, from Liverpool to Hong Kong, 1854.

Month.	Courses.	Distance.	Latitude.	Longitude.	REMARKS.
June 17th.	S. 59° W.	123	52 20 N.	5 55 W.	At 2, P. M., proceeded to sea, wind North. At 12.30, midnight, discharged the pilot off the Kenies. Fresh breezes and overcast, with light rain. Wind W. N. W.
" 18th,	25	227	48 55	8 27	Fresh breezes, and overcest, with rain. Wind N. and W.
" 19th,	27	209	45 49	10 17	Brisk, light and moderate, with good weather; overcast at times. Wind N. and W.
" 20th,	33	120	44 08	11 50	Moderate and light, with good weather. Wind S. W. to N. W. Brisk and some rain. Brisk and light, with rain at 9.30. Clear winds. Wind S. by W. to N. W.
" 21st.	30	148	42 01	13 32	Light Winds and good weather most of the time. A little rain and some fog. Wind N. W. by N.
" 22d.	33	144	40 01	15 15	Light winds and overcast weather. Wind N. N. W. Some fog, and light rain and mist. Wind N. E.
" 23d.	27	163	37 35	16 48	Light winds, and overcast most of the time. Some rain and fog. Ends pleasant.
" 24th.	11	117	35 40	17 15	Light airs and overcast weather. Wind N. E.
" 25th,	14	142	33 22	17 55	Light winds and overcast weather. Slow work. Wind N. W.
" 26th,	17	214	29 57	19 07	Moderate and brisk, with fine weather. Wind N. E.
" 27th,	21	224	26 28	20 37	Moderate winds and fair weather. Overcast at times. Wind N. E. by E.
" 28th,	25	136	24 26	21 41	Light airs and calms, with good weather. Cloudy part of the time. Wind N. E. by E. N. E.
" 29th,	25	177	21 45	23 01	Light, moderate and brisk, with fine weather most of the time. Wind N. & E.
" 30th,	29	234	18 20	25 01	Brisk Trades and fine weather. Wind N. E.
July 1st,	6	219	14 42	25 24	Brisk and fine, but very hazy; passed within 20 miles of St. Antonio without seeing it. Wind E. N. E. Brisk and light, with overcast weather. Wind variable. Moderate. Some light rain, and some fine weather. Wind E. S. E.
" 2d,	S. 16 E.	172	11 57	24 35	Light winds and several rain squalls. Some fine weather. E. to E. N. E.
" 3d,	23	100	10 25	23 55	Current E by S., 1 mile per hour. Light airs and squalls. Some fine weather. Wind S. W. to W.
" 4th,	8	75	9 10	23 45	Light variable airs, mostly from the West, with much rain, and some fine weather. At 2 A. M., quite a hard squall from the East. Ends light from the West, and rainy weather. Baffling.
" 5th,	55	93	8 17	22 28	Calms, light winds and brisk breezes. Some rain and some fine weather. Ends fine. Current E. by N., 1 mile per hour. Calm and S. S. W.
" 6th,	16	82	6 58	22 05	Brisk and light, with fine weather, except a light rain squall. Wind South. Current East, 1 mile per hour.
" 7th,	S. 34 W.	88	5 45	22 55	Moderate breezes and fine weather. Wind South. Current East, one and a half miles per hour.
" 8th,	S 55 E.	144	4 23	20 57	Moderate breezes and fine weather, except a light rain squall in the middle watch. Wind S. S. W. Current East, 1½ mile per hour.
" 9th,	S. 56 W.	95	3 30	22 17	Moderate breezes and fine weather. Wind South. Current N. W. by W., 1¼ miles per hour.
" 10th,	51	180	1 37	24 37	Moderate breezes and fine weather. Wind South Current W. N. W., ¾ mile per hour.
" 11th,	11	126	0 27 S.	25 00	Light Trades and beautiful weather. Wind S. E. by S.
" 12th,	S. 2 E.	181	3 28	24 53	Moderate Trades and fine weather. One rain squall at 2, A. M. Wind S. E. by E.
" 13th,	S. 8 W.	206	6 52	25 25	Moderate, brisk and strong Trades, with passing squalls, some of them fresh. Wind S. E. Fine weather. Wind S. E. by E. Our ship is deeply laden with coals, and moves heavy, but behaves well. A high sea from S. E. Wind S. E. by E.
" 14th,	10	245	10 52	26 07	Strong trades and fine weather; now and then a trade squall. Ship does not sail as well as she ought. Wind S. E. by E. S. E.
" 15th,	7	238	14 49	26 37	Strong Trades and good weather. A few squalls. Sea bad. Wind S. E. by E.
" 16th,	5	252	18 59	27 00	Brisk trades and smooth, pleasant weather most of the time; now and then a Trade squall.
" 17th,	S. 2 E.	246	23 05	26 53	Brisk trades and fine weather, with the exception of a few squalls. Wind S. E by E. S. E.
" 18th,	S. 9 W.	235	26 57	27 30	Brisk breezes and squally. Some fine weather. Wind veres, and hauls in squalls several points. Wind S. E.
" 19th,	S. 7 E.	223	30 38	27 00	Brisk breezes and fine weather, A swell from the West. Wind E. by S.
" 20th,	53	165	32 18	24 27	Moderate and light, with good weather. Variable. Passed a bark steering S. E. Wind East.
" 21st,	55	140	33 39	22 13	Light winds, and smooth, pleasant weather. Wind N. E.
" 22d,	63	159	34 51	19 22	Light winds, and fine weather. A long swell from S. W. Wind N. W. by N.
" 23d,	72	277	36 16	14 00	Brisk breezes and fine weather until 3, A. M., when it began to rain and puff, which lasted to 9, A. M.; it then cleared, and continued fine. Current E. by N. Wind N. N. W.
" 24th,	81	148	36 40	11 00	Brisk, moderate and very light, with good weather. Wind N. W. Overcast at times. Swell from West. Wind S. W. to N.
" 25th,	79	171	37 12	7 30	Light winds and fine weather. Cloudy part of the time. Singular weather for the dead of winter. Wind N. N. W.
" 26th,	69	161	38 10	4 20	Light winds and good weather. Sometimes overcast. Wind N. N. W.
" 27th,	70	195	39 15	0 26 W.	Light and moderate, with fine weather. Cloudy at times. Wind N. N. W. to N. N. E.

July 28th,	S. 75 E.	291	40 31	5 40	Brisk, and fine weather most of the time. Some mist and fog in the latter part. Wind E N. E. and N.
" 29th,	N. 86 E.	277	40 52	11 40	Brisk breezes, and some strong puffs, with mist and fog, with intervals of fine weather.
" 30th,	88	264	41 01	17 30	First part, strong breezes and passing squalls. Middle and latter part, moderate winds, with good weather. Cloudy at times. Wind N. N. W.
" 31st,	84	218	41 25	22 18	Moderate and light. Cloudy weather. Some rain, and sometimes fine. Wind N. W.
Aug. 1st,	86	187	41 11	26 25	First part cloudy, with rain. Wind S. W. to S. Middle and latter part, moderate and good weather. Wind S. by W.
" 2d,	85	129	41 00	29 15	First part, squally. Wind S. W. to S. Latter part, light airs and fine weather. A few passing clouds with hail and rain. Variable.
" 3d,	S. 88 E.	162	41 07	32 50	Light, variable airs and fine weather. A few light squalls. Wind N. W. to W.
" 4th,	84	125	41 21	35 35	Light, variable airs and fine weather. What weather and winds for middle of winter! Wind S. W. to N. W.
" 5th,	77	189	42 00	39 30	Comes in with moderate breezes and fine weather. Wind E. to E. N. E. M. P., Brisk breezes and cloudy weather. Wind E. N. E. to N. L. P., strong breezes, and squally, rainy weather; much lightning in morning watch.
" 6th,	87	193	42 10	43 50	Strong gales and squally weather; much lightning in the W. & S. W. Wind N. N. E. Moderate breezes and misty. Wind North. Light airs, rainy, foggy weather. Wind N. to S. W.
" 7th,	N. 78 E.	122	41 45	46 30	Strong breezes and gales, with rainy, dirty weather. Wind South.
" 8th,	S. 89 E.	238	41 47	51 50	Strong gales and hard weather. Wind S. by W. to S. W. Strong breezes, with hard squalls and moderate intervals. Brisk breezes and fine weather. A few passing hail squalls. Wind S. W. to W. N. W.
" 9th,	88	249	41 58	57 25	Brisk and moderate, with passing squalls, some of them strong. A bad sea. Rolling hard. Wind W. N. W.
" 10th,	N. 80 E.	239	41 16	62 40	Brisk and moderate, with cloudy weather and several squalls. A very high sea from the West. Ship rolling tremendously.
" 11th,	S. 89 E.	230	41 22	67 45	Brisk and light, with good weather. A few passing mist squalls. Wind W. S. W.
" 12th,	N. 76 E.	81	41 03	69 30	Light, variable airs and calms, with cloudy weather. Some rain. Wind S. W. to S. E. & S.
" 13th,	81	254	40 23	75 00	Light, brisk and strong, with good weather, although cloudy at times. Wind S. S. W. to S. W,
" 14th,	78	322	34 20	81 50	Strong puffs at moderate intervals, with passing squalls. A very high sea running. Wind S. W.
" 15th,	59	202	37 35	85 30	Very unsteady, strong puffs, and squally, with moderate intervals. Ends moderate, with fair weather. Wind S. W. to S.
" 16th,	67	143	36 40	88 15	Light and variable from South to North by the West. Good weather, and fine light squalls, Variable.
" 17th,	53	192	34 45	91 25	Moderate, and unsteady, smooth sea; fine weather most of the time. Occasionally a light squall. Wind N. W. to N. N. W.
" 18th,	53	140	33 20	93 40	Light airs from S. W., West, N. W. and North. Fine weather.
" 18th,	33	82	32 11	94 34	Light airs from N. W., West, S. W, and south, with fine weather. A long swell from S. W.
" 20th,	52	68	31 30	95 37	Light airs and calms. Rain in the latter part. Wind E. to N. E.
" 21st,	33	199	28 43	97 40	Calm and brisk, with unsettled weather. Strong gales and hard squalls, with moderate intervals. Calm & S. W.
" 22d,	27	278	24 35	100 00	Brisk breeze and passing squalls, with intervals of fine weather. A high sea from S. W. Wind W. S. W.
" 23d,	21	201	21 28	101 20	Unsteady; brisk at times. Fine weather. A long swell from S. W. Wind S. W. to S. E.
" 24th,	16	236	17 42	102 30	Unsteady Trades, moderate brisk and strong. Good, though overcast weather. Wind S. E. to E.
" 25th,	18	283	13 14	104 03	Strong and brisk trades, with fine weather. Wind E. by S.
" 26th,	15	255	9 08	105 11	Brisk Trades and fine weather. Water much clouded at times. Wind E. by S.
" 27th,			Near	Angier.	Brisk Trades and fine weather. At 3.30, A. M., made Java Head. Passed through Prince's Passage. Wind S. E.
" 28th,	14	276	4 40	106 20	Light airs and some calm. Passed through Sunda Strait into the Java Sea. Variable. Brisk breezes for a few hours in the latter part. Wind East.
" 29th,	17	159	2 08 S.	107 08	Brisk and moderate, with fine weather. Passed through Gaspar Straits: noon, Gaspar Island bore S. ½ W. Wind E. S. E.
" 30th,	17	228	1 30 N.	108 15	Brisk, moderate and light, with fine weather. At 2, A. M., Direction Islands bore E. by S. 3 miles. Wind E. S. E.
" 31st,	N. 4 W.	61	2 30	108 11	Very light airs and calms, with smooth, hot weather. At meridian, West Island N. E. 26 miles. Calm, S. E.
Sept. 1st,	N. 25 E.	56	3 20	108 35	Light airs and calms. Latter part, a breeze from S. S. W. Fine weather. North in sight.
" 2d,	21	98	4 52	109 10	Light airs, and smooth, hot weather. Wind S. S. W. to W.
" 3d,	14	88	6 17	109 32	Light airs, calms and brisk breezes, with smooth, hot weather, with now and then a squall. Variable.
" 4th,	18	249	10 14	110 50	Brisk breezes and good weather most of the time. Wind West. Squally appearance in the North and N. W. at times; also, sharp lightning. Ends fair. Wind W. S. W.
			13 49	112 25	
" 5th,	23	234	"	"	Brisk, moderate and light, with fine weather. Wind S. W.
" 6th,	27	109	15 26	113 15	Light winds and fine weather; with smooth Sea. Current E. by N., 1 mile per hour. Wind S. E. to S. S. W.
" 7th,	12	117	17 20	113 40	Light winds, and smooth, hot weather. South and E. N. E.
" 8th,	3	124	19 24	113 48	Light winds, and smooth, hot weather. Wind N. E. to E.
" 9th,	11	174			Brisk, moderate, with fine weather. At 3.30, A. M., made the Ames Bars, bearing N. by E. dis. 15 miles; at 4.30, A. M., took a Chinese pilot; 83 21.24 days from the Liverpool pilot.
		15,016			☞ Whole distance sailed on straight course, from noon to noon, 15,000 miles.

THE OLD PRIVATEER SERVICE.

"It is a bright attribute of the American Tar that he has never destroyed the rights of the nation. In its DEFENCE ONLY is he to be found.—*Navy Com. Cong.* 1812."

WHEN foreign presses and foreign statesmen refer to our limited capabilities for ocean warfare, in consequence of our little navy, they but kindle anew our pride in the unimpeded progress of our naval architecture, and renew and strengthen our confidence in the efficiency of our marine militia, as an army of NAVAL VOLUNTEERS in time of war.

The earliest, if not the very best services rendered our country in its past conflicts with other nations, were rendered promptly and in season by private armed vessels manned by ordinary merchant seamen, and authorized by governmental authority. Even in colonial times—as early as 1758, there were fitted out of the port of New-York alone, 48 privateers, with 5,660 men, carrying 695 guns against the enemy, in "the Old French War."

It is a part of our history that the number of public and private armed vessels fitted out by authority in the United States during the Revolutionary War—from 1776 to 1783, was *one thousand five hundred and fifty-nine*; that 511 of these were from the State of Massachusetts, 477 from Pennsylvania, 195 from Maryland, 182 from Connecticut, 90 from New-Hampshire, 51 from Virginia, 24 from Rhode Island, 10 from New-York, 9 from South Carolina, 6 from New-Jersey, and 4 from North Carolina. These vessels carried, in the aggregate, *fourteen thousand five hundred and ninety-two guns*, and were manned by a marine army of *fifty-eight thousand five hundred and forty-nine* American citizens. And our naval statistics show that their capture of armed British vessels, as well as of vessels engaged in British commerce, were numerous.

In our second war with Great Britain, it was sound policy to be governed by the philosophy of history, for it illuminated our path, and held its torch to the future. And when, on the 19th day of June, 1812, President Madison in the Declaration of War, exhorted "all the good people of the United States as they love their country, as they value the precious heritage derived from the virtue and valor of their fathers, to support and invigorate all the measures that might be adopted for obtaining a speedy, just and honorable peace," the young and athletic nautical men of our seaboard left their happy homes under the encouraging acts of Congress, armed their own vessels as had their fathers before them, and went forth upon the ocean to do battle with an enemy of great naval superiority. And, for their brilliant achievements they participated at the time in their country's gratitude, the crowning glory of the war.

Young America was appealed to by the proceedings of Congress, and most fervently appealed to by the press. In "Niles' Register" of that period,

it was triumphantly argued that nothing but the privateer service could subdue the enemy. "What difference (said he in 1812) whether the harm of war is produced by a national or a private armed vessel? Did our merchants who have lost 917 vessels by British captures, feel any gratification that the most of them were taken by his Majesty's men of war? Were spoils less rigidly exacted by a 74 gun ship than by a privateer of 4 guns, and were not all equally condemned? War, whether on land or sea, is constituted of acts of violence on the persons and property of individuals, and excess of violence is the grand cause that brings about peace. One man fights for wages paid him by the government, or a patriotic zeal for the defence of his country. Another, duly authorized and giving the proper pledges for his good conduct, (with motives equally patriotic) undertakes to pay himself at the expense of the foe, and serves his country as effectually as the former. And government, drawing all its supplies from the people, is in reality as much affected by the losses of the one as the other; the efficiency of its measures depending upon the energies and resources of the whole.

"In the United States (continued Mr. Niles) every possible encouragement should be given to privateering when at war with a commercial nation. We have tens of thousands of seamen who without it would be destitute of the means of support, and useless to their country. Our national ships are too few to give employment to a twentieth part of them, or retaliate the acts of the enemy. But, by licensing private armed vessels the whole naval force of the nation is truly brought to bear on the foe; and, while the contest lasts, that it may have the speedier termination, LET EVERY INDIVIDUAL CONTRIBUTE HIS MITE IN THE BEST WAY THAT HE CAN, TO DISTRESS AND HARASS THE ENEMY AND COMPEL HIM TO PEACE."

Such appeals from the press were not made in vain—and the memorials of the people themselves which poured into Congress, declared the popular conviction "that the successful issue of the present war materially depends upon the effectual annoyance of the enemy by privateers; that the extent to which that species of warfare may be successfully prosecuted is incalculable, for no bounds can be prescribed to the daring and hardihood of American seamen; that it is peculiarly entitled to the fostering care of Congress; that it is indispensable to a prosecution of the war." And one of these memorials, preserved in the invaluable Register of Mr. Niles proceeds:

"To the bold and successful efforts of our private armed vessels we may attribute the growing confidence of every class of our citizens in our ability to contend on equal terms with the self-styled Mistress of the Ocean. The examples of heroism on the part of our seamen in the East, cannot fail to inspire with a corresponding ardor our soldiers of the North and West, producing a rivalship of patriotism and courage, insuring a war of glory, terminating in an honorable and lasting peace."

The brilliant results which followed proved the memorialists to have been imbued with the spirit of prophecy. All our registered seamen at that time amounted only to 106,737, and in less than one year nearly a fourth of them were actively engaged in the privateer service. Within four months from the declaration of war 26 privateers, with crews amounting in the aggregate to 2,222 men, and carrying 212 guns, were fitted out of the port of New-York—17 were built expressly and fitted out at Baltimore, mounting 147 guns, many of which were 18's and 24's, and carrying 1538 men. And in addition to these, Baltimore had already sent to sea 25 fast-sailing letters of marque, with 6 to 10 guns each, and each having from 40 to 50 men. Indeed, up to that time, there were registered at Baltimore as at sea against the enemy, *forty-two* private armed vessels, carrying 330 guns and from 2,800 to 3,000 men—and there were ten more large privateer schooners then on the stocks at that port. And, it should be added, that the Baltimore privateers were eminently successful; for it is of record in the "Register" of that date—"Not one of our fast cruisers has yet been taken by the enemy."

In less than six months from the commencement of the war, 18 large privateers, carrying 115 guns, had sailed from Salem, Mass., and had taken *eighty-seven* prizes, 58 of which were armed with 127 guns. And within that short period this service had already captured from the enemy at sea, an aggregate of *three hundred prizes*, and brought them safely into port.

Our young Yankee seamen were amongst the first in the field, and amongst the last to leave it. Their alacrity and patriotism was appreciated *then*, and acknowledged everywhere. And they shall be appreciated *now* when the tale is all told.

It is a matter of historical record that before the close of the war we had *five hundred and seventeen privateers* authorised by the Government, manned by *twenty-five thousand five hundred and seventy-six American citizens*, and gallantly carrying against the enemy afloat TWO THOUSAND EIGHT HUNDRED AND FIFTEEN GUNS. During that war these vessels made *one thousand three hundred and forty-three captures*, many of which were heavily armed British privateers.

These data are reliable, for they are from the official records of the Government.

The Yankee privateer was by no means a "long shore cruiser" altogether. He scoured the Atlantic in search of the enemy, and even pursued him into his own bays and harbors on the shores of Europe. Niles' Register, of the 16th June, 1813, announces the arrival at Salem, of the privateer ship *America*—significant name—of 18 guns, with many valuable prizes, and adds: "She was fifteen days cruising in the *English Channel.* In the strictest sense, the *America* had bearded the *British Lion* in his own den!

But for the efficiency of the privateer service at that period, how was it

possible for us to do battle upon the ocean successfully with a power which boasted of a naval armament of "nine hundred and ninety-four British vessels of war"? Much less was it possible in the war of the Revolution, when we had only 556 national guns afloat, and only 27 small vessels to carry them.

Let it be remembered that everything was done by the Government to encourage privateering. The force was regarded as a MARINE MILITIA, and assimilated with the naval service afloat, as the militia or volunteers on shore are assimilated with the regular army. The laws of Congress regulating the distribution of prize-money on board privateers was essentially the same as those regulating its distribution on board vessels of the navy capturing prizes of inferior force. In both cases one moiety fell to the officers and crews. The same bounties and premiums allowed to vessels of the navy were allowed to privateers by law, and the latter contributed two per cent. of their prize money to a national fund for "widows, orphans, and disabled seamen;" which was not required of navy vessels. Those who were disabled in the privateer service received their pensions from the government as though they had belonged to the regular navy or army of the country. Indeed, it was the favorite service of its time; and we have adverted to it in the hope of reviving recollections that should never be forgotten in a country like ours, to which a MARINE MILITIA is so indispensable in time of war.

It should not be omitted, in conclusion, that while the government is liberally dispensing its evidences of gratitude to those who have served the country faithfully in the hours of its peril, by dividing amongst them its public domain, the Congress of the United States has elicited the public astonishment by entirely overlooking or disregarding "the old privateer service."

It is never too late to be JUST.

LARGE PURCHASE OF STEAM-SHIPS FOR FRANCE. — On Saturday, Feb. 9, the purchase was made, of the General Screw Steam Shipping Company, of the *Jason*, *Indiana*, *Golden Fleece*, *Calcutta*, *Argo*, *Queen of the South*, *Hydaspes*, and *Lady Jocelyn*—amounting, we hear, to nearly £500,000. We believe this to be the largest purchase of shipping ever made in one line, and it has been effected by Mr. Graham (of the firm of Maitland, Cuthbert & Co., of Paris), Mr. Brett (of the firm of Cunard, Brett & Austin, of London), and M. Beraud Villars (manager of the French Clipper Company).

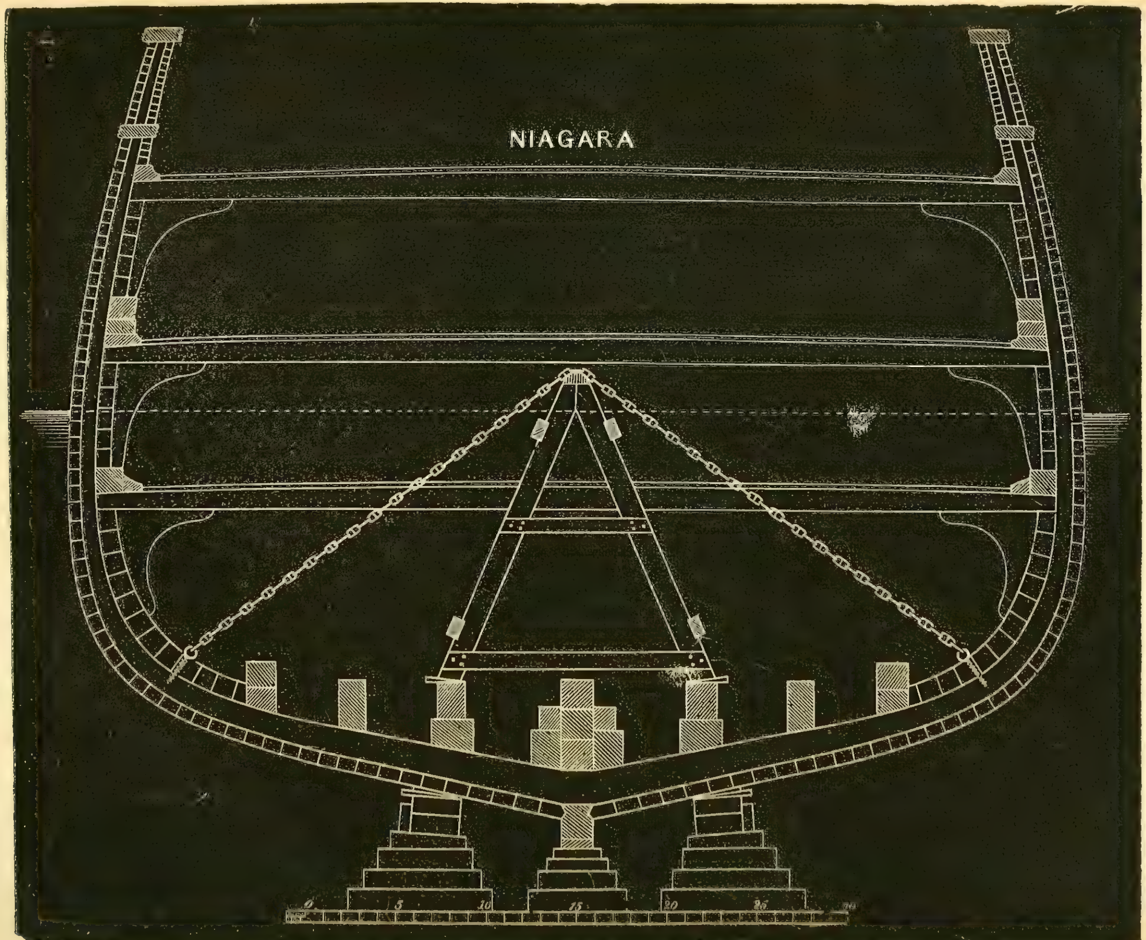
THE NIAGARA.

The launch of this vessel, which took place on the 23d of February, 1856, at the Brooklyn Navy Yard, is one which, in its results, will not soon be forgotten by those whose misgivings and free expressions, in reference to her flexiformity of dimensions, had formed the ground-work of their expectation. But in this case, as in all others where opinions are based on prejudice, they are most valuable to those to whom they belong, and whence they emanate. The expected rupture did not take place, and it will be difficult to tell when it will. Some persons have discovered that if she had not received the previous preparation for launching, a rupture must have taken place—an important fact, which we understand to mean no more than this, that, if she had possessed no more strength than her sister ships, she must have been seriously injured; to which proposition we heartily assent, inasmuch as she is at least 80 feet longer than the other five vessels authorized by the same act of Congress. The deflection was seven-eighths of an inch in 300 feet of her length; which furnishes another demonstration of the superiority of the "Nautical" over the "Naval," in this country; and our hope now amounts to expectation that we shall soon hear that the order has been revoked by the Chief of the Bureau of Construction, which classifies the shipbuilders of New-York as "*very good axe and adze carpenters*," and that they will now be recognized as very good shipbuilders. However that may be, we shall continue to claim, and with some show of propriety, that the improvements in the construction of this vessel are not confined exclusively to the form of the fabric; but that war steamers can be launched as well as built upon scientific principles, without impairing their efficiency either by strain or rupture, and that, too, by the parties referred to. The folly of transmitting the weight of the entire fabric to the weakest parts of ships, (the bottom and decks), was not committed in the launch of this vessel, as will be seen by reference to the annexed engraving; and we may add, that this arrangement was quite as essential for docking the vessel in the stone dry-docks of the government as for launching her. The bottom of the vessel being the weakest part of the outside shell, cannot sustain the weight of the fabric without a disproportionate strain, which causes such transformation of shape as is commonly denominated "hogging." Hence, we find that nearly all of our government vessels are hogged, in docking them in the stone dry-docks at Charleston, Brooklyn, and Gosport Navy Yards. The very small amount of vertical support the sides and bilge of the vessel receives, from two sets of shores, the one directly horizontal, and the other nearly so, before the bilge is clear of the water, is of little consequence; and no one up to the present time has been able to determine what proportion of this deformity of shape was consequent upon docking the vessel. In other

words, no one can make a just appropriation of that amount of hogging which properly belongs to the dry-dock, and show what amount of deformity belonged properly to the surges and perils of the sea. Inasmuch as it was not the province of the constructor of the Niagara to alter the dock, it only remained for him to prepare his vessel against its dangerous tendencies; and this was fully accomplished in the preparation for launching her. Hence, it will be perceived that it was only necessary to put up stanchions between the chain supporters and the keelson, when the sides would at once be required to sustain their due proportion of the strain demanded of the keel, in the same manner in which they relieved the bottom in launching. We are aware that it is assumed, that, if a vessel in dock cannot spread, it follows that she cannot settle. But "*axe and adze carpenters*" know better than this. It is a chimerical notion, and has no foundation in truth or science. Every ship placed in the docks referred to, has *less* dead rise when the water is removed than when she was floated into dock, because of her being allowed to bear almost her entire weight on her keel. The keel and bottom of a ship 200 feet long may spring from two to four inches, and the deflection would be hardly noticed; and if it was, it would be charged to *sea, instead of dock service.* Nor can it be otherwise in government vessels, with a live oak keelson made up of short lengths from 25 to 30 feet.

With regard to the preparations for launching the Niagara, we may add, that the launching ways received all the inclination that it was desirable to give them, which, in the general average, was seven-eighths of an inch to each foot of length, with a spread of cradle between ribands of 18 feet, increased an inch and a half in 320 feet, and to three inches in 470 feet. The ways were laid hollow, or with a sag of 10 inches in their whole length; giving an inclination of one and a quarter inches at the upper or forward end. The packing was vertically arranged, (usually called poppets), the longest of which was secured at head with cleats, and with chains, both at head and heel. The bilgeway was made up of two thicknesses, the lower of which was bolted to the ground-way at the forward end. Between the two courses of bilgeway, wedges were placed, the entire length of the cradle, and slightly rammed midships, while at the extremities they were driven more firmly. It was not the design to raise the ship, but only to equalize the strain. When the preparations were made, the keel-blocks were split out, and the shores removed as the blocks were taken out. When the blocks and shores were all removed, which required about one hour, the bolted end of the bilgeway forward was separated from the main piece by sawing it off, when the ship glided into her destined element without noise, and with no other effect upon the lubric wave she generated, than a discoloration by stirring up its murky bed.

Her draught of water when launched was 14.62 feet forward, and 15.33 feet aft. This slight trim by the stern is consequent upon the shaft-bearing be-


NIAGARA
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ing on the stern-post, the weight of which is about 4.5 tons, without which her trim would be about even keel.

ENGINES OF STEAMER NIAGARA.*

The engines (three in number) are horizontal and direct-acting. Each frame for cylinders, cast in one piece, has slide-valves, and a separate cut-off or expansion slide-valve, adjustable so as to cut off at any point from three-eighths to five-eighths of the stroke.

Each cylinder has its own separate condenser, air-pump, and hot-well—in fact, with the exception, only, of the main shaft, there are three complete engines; so that should either become deranged or disabled, the others will be available.

The air-pumps are 22 inches in diameter, and are worked direct from one piston-rod of the steam cylinder; and the feed-pumps are worked from the other piston-rod. The main-shaft, the cranks of which are set at an angle of 120° with each other, is 17 inches diameter, of wrought iron, and the whole length over 100 feet.

The propeller (of composition) is a screw, having a gaining-pitch, which at periphery is 29½ feet. Screw, 18 feet 3 inches diameter, and 4 feet 9 inches in length. Estimated weight of screw, 23,600 lbs.

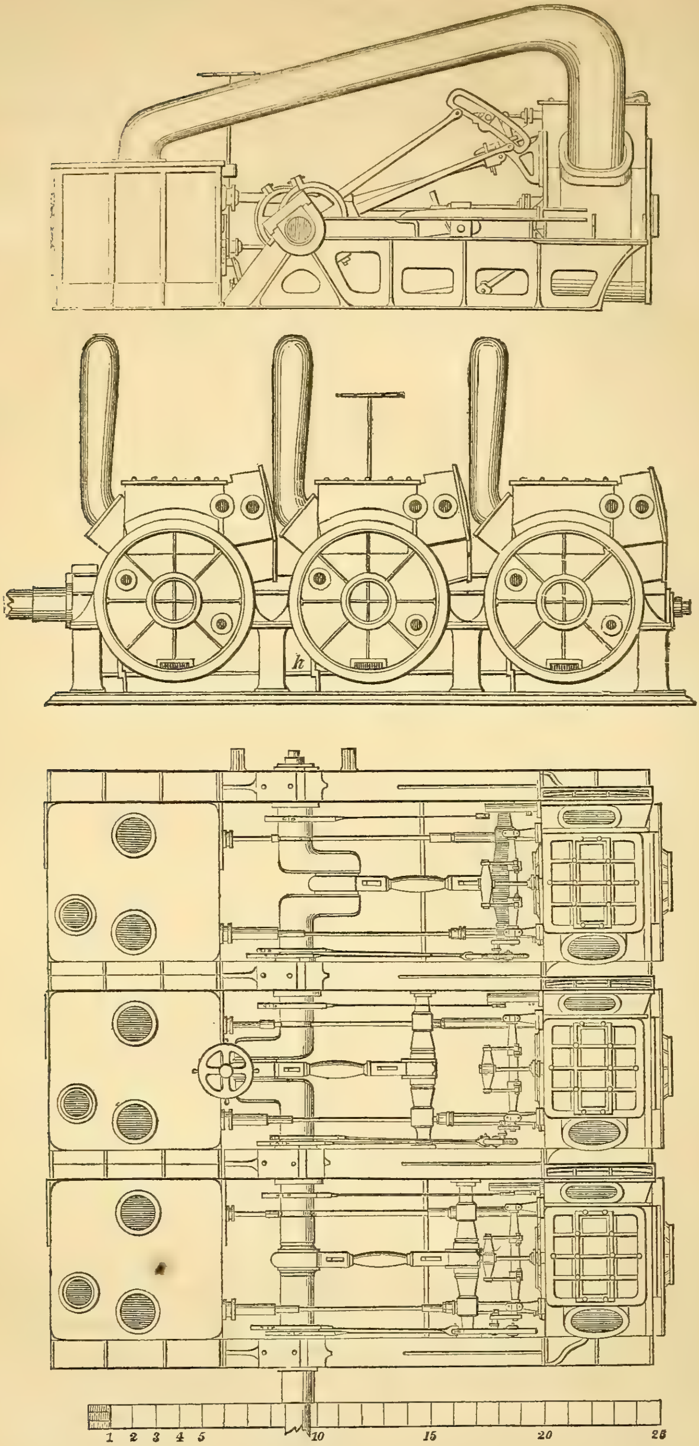
The boilers, 4 in number, are 11½ feet in length, 21 feet in width, and 15 feet in height. They are of the vertical tube variety, and the arrangement patented by Mr. Martin, the Engineer-in-chief, United States Navy. They are very compact and well-arranged, and will probably prove as efficient and economical as any boilers of this description. They will be set in pairs, the flues discharging into two chimneys, the one forward of the other.

The engines have been designed by Mr. Copeland; and strength, simplicity, and convenience have been sought, without reference to appearance or superfluity as such. No attempt at ornament is to be perceived.

The contractors for the machinery of the Niagara are Messrs. Pease and Murphy, and the execution of the whole is such as to reflect great credit upon them, and exhibits a determination that they shall fairly claim a full share of the reputation which we have no doubt will be awarded to all concerned in the construction of this fine ship, when fully tested.

As an evidence of the extent to which simplicity has been carried on these engines, we may mention, that each cylinder has its main steam-chest, expansion steam-chest, and one of the cylinder-heads all cast in one piece. Also the condenser of each engine, with its hot-well, air-pump, and feed-pump, are cast in one piece. This, of course, produces very complex castings; but, notwithstanding their complexity, there has scarcely a blemish of the most minute character been discovered in any of them. In fact, the contractors are evidently desirous that the whole should prove strong, serviceable, and efficient, and we hope and trust they will succeed.

* See page 14.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THE SHIP-BUILDER AND THE APPRENTICE.

The time was when every ship-yard had its quota of indentured apprentices and the amount of business done in a ship-yard was judged of by the number of apprentices employed. A number ranging between two and fifty. These days are past—and what a change! Scarce a ship-builder can now be found who is willing to encounter the care and anxiety consequent upon the system of apprentices, for the doubtful profits, and, in many cases, more probable loss incorporated with the system. There are several reasons for this change in the minds of ship-builders, none of which is more prominent than that which admonishes that apprentices are unprofitable; consequently we have no well regulated system of transmitting to posterity that concentration of mechanical knowledge, so essential to qualify men for the responsibilities of ship-builders. When the apprenticeship system was incorporated with ship-building in New-York, in the first twenty years of the present century, with perhaps but a tenth part of the ship-building that there now is, there were threefold more mechanics who did honor to this glorious art than there now are, in proportion to the amount of work performed. The reason to us is obvious; the apprentice then became profitable as he advanced in knowledge, the builder doing all his work by the day, except planking the bottom below the wales. He could then give the apprentice access to all parts of the vessel; consequently an ambitious boy would soon show his proclivities to excel, and, as a consequence, he would be put forward, and it was not a rare occurrence to see an apprentice the foreman of a ship-yard. The obligation was mutual; while the builder was obliged to furnish the opportunity to learn, the boy was to improve it; else no blame could attach itself to the master. It was in those days that such men as Sydney Wright, Stephen Smith, Isaac Webb, Adam Brown, David Brown, Foster Rhoades, and a host of other builders of the first water, were inducted into the ranks of nautical mechanics. It was then usual for an apprentice to spend from five to six of the last years of his minority in the acquisition of mechanical knowledge: then they were boys until they were twenty-one years of age—but alas for this progressive age! they now are men at sixteen, work under instruction from one to two years, and then, with but a smattering knowledge of the art, they are added to the list of mechanics.

There might be some show of reason even for this classification, were it not that in very many, if not in a majority of instances, these persons have been employed during the whole of their pupilage upon only one kind of work, such as framing, or planking, or lower deck and ceiling; and, inasmuch as the ships are now built by sub-contractors, these men in prospect are employed by those contractors, who generally confine their attention to

one kind of work; hence there are companies for framing, also for planking, and for doing the work of lower deck and ceiling. These sub-copartnerships are usually confined to two or three persons, and the remainder of the company, consisting perhaps of from ten to sixteen, is made up of pupils and journeymen who have passed through this season of hasty probation. These sub-contractors confine their attention chiefly to one kind of work, and go from ship to ship on the same job. Their workmen of course go with them, and seldom do these pupils obtain an opportunity to do the better or more particular kinds of work, unless the supply of workmen is not commensurate with the demand; the best mechanics, or the best workmen, are usually employed on the top work of the vessel, while the pupil or the minor under instruction would be, not only less profitable on first-class work, but would require the attention of a tutor, whose time is too valuable to be spent thus, and the unfortunate inquirer is either left to shift for himself, as best he can, or is hired out by his sub-contracting employer to become a coadjutor on another coarse job. Indeed, a young man is seldom more fortunate when he engages with the builder himself; he expects a remuneration for his services commensurate with his maintenance, which is indeed more than he is worth to the builder, who, having often an entire ship under contract, the services of the apprentice is let also to the sub-contractor, who consults his own interest in the kind of work in which he is to be employed—and the unfortunate pupil finds that the rotary motion of the grindstone, or the more frequent use of his shoulders in bearing materials to their place of destination, are channels which are foreign to his aspirations, and have an obtuse angle of induction to science, however keen his perceptions or great his proclivities for mechanical knowledge; and at the termination of two or three years' pupilage he finds that he has acquired a knowledge of the use of tools, but is almost entirely ignorant of the rules of art, without a basis upon which to exercise his judgment, or a pilot to guide him across the shoals of error, beyond which lie the principles of truth and science. Chagrined and mortified at his unfortunate position, alas! too often his ardent aspirations, thus chilled at the outlet, seldom acquire a degree of temperature above that of indifference, while the acquisition of such knowledge as leads into the channels of distinction, is only obtained under the most ardent temperament, and by patient investigation. Under such discouraging circumstances, it is no marvel that so few nautical mechanics rise to distinctive eminence in the line of their profession.

With a view of furnishing the means of remedying this manifest defect, we have taken up the subject in this *Magazine,* and shall give such lessons in practical mechanism as will combine subjects of interest with those of instruction, whether it be in the laying of a keel or the launching of a ship, or in the simplest problems of inductive art.

THE CAUSES OF FOUNDERING.

REMARKS ON CAULKING AND SECURING THE PLANKS AND CEILING OF SHIPS.

It needs no profound investigation to discover that the planking of a ship furnishes her only defence against the deluging element, the sea; and at once renders the skeleton fabric of the ship-builder a navigable ark of mechanism. It is the planking, beyond all other parts of the construction, that endows the vessel with its properties as such, and secures it the qualities of flotation. Upon the planking we rest for safety, as the basis of our adventures upon the mighty deep. Of what consequence is the mere frame of the ship, compared with the skin that covers and protects it from the engulphing element? Its office is subordinate, being comprised in the duty of supporting and furnishing a medium for working the planking. The most rigid analysis will fail to disclose any higher utility for the immense proportionate mass of wood composing the *frames* of vessels. We hold it to be susceptible of mathematical demonstration, that the present recognized proportions of material composing the planking and framing are vastly disproportionate to the natural requirements for strength in each, taking into account the longitudinal and transverse duties of the structure. A vessel having dimensions of four times the breadth for length, should have *sixteen* times the strength longitudinally that may be found commensurate with the breadth, and the service for which she is intended, in order to furnish the mechanical equilibrium in every direction of the fabric. It is an axiom in mechanics, that doubling the length of the beam (which a vessel may be regarded under the condition of varying supports), requires quadrupling the area of its section to maintain proportionate strength. If a vessel should be but two breadths for the length, four times the strength athwart ships would suffice, and so on. Now, we do not say that it is always requisite that a vessel should have an equal amount of rigidity in the increments of length and breadth, the nature of the service determining the measure of utility, but lest principles should be forgotten, we have alluded to this sirmark in architecture. From the contemplation of small things, we may arrive at truth concerning greater. Behold the canoe on the shoulders of the savage, and here investigate the first causes of man's triumph in mechanical ingenuity! From the pliant bark of the birch, and the slender fibres of the ash, the barbarian moulds nature to his wants, and supplies a craft unequalled for buoyancy, strength, and elasticity, in the framed catalogue of shipping. Would we learn the secret of his success? We have it in the *selection and distribution of material.* Can the builder, boasting of civilization and science, exhibit a better practice in the production of modern fleets? Inspect the canoe; it will show the slightest *frame* given to a fabric

for flotation. Its durability may decline, but it serves the various purposes of its savage builder, and like him, in the integrity of human pride, goes to its last account in peace and security, and with an *unbent spine*. Again, observe the small boat hanging at the davits, without a " hogg" or a "sag" in the sheer; principles have not been violated in its structure, as in that of the ship at whose davits it hangs. Why cannot ships be suspended by their ends? Evidently, for want of strength. The *rationale* of their construction is reversed. The canoe builder, who modelled his craft by an excavation in the ground, only used his *thin hoops* to give shape and permanence to his sheets of bark, while the modern ship-builder has erected huge timbers for his frame, and walled them from the breach of the fluid by planking. To the precarious rigidity of scarphed timber keels and keelsons, he has trusted for what is lacking in the longitudinal strength of the bottom, while upon the sides where the distribution of materials was even more favorable for longitudinal strength, he has not trusted to the thickness of planking and ceiling. Let us ask, if a floor timber for a ship which is thirty feet long requires to be sided fourteen, and moulded twenty-two inches, how large, sided and moulded, must be a keelson (240) two hundred and forty feet in length? and how much greater would be its dimensions at midships than at the extremities of the vessel? When these questions have been resolved, we think the importance of a ship's planking will receive its just measure of thought at the hands of underwriters and commercial men.

The ceiling of ships hold a sister relation for strength to the planking, and should be adapted to higher uses than the too common one of covering up the spaces and hiding the timbers of the frame. Where this is all that is sought in ceiling vessels, it were vastly better, if it were possible, to leave the frame exposed for the purposes of ventilation and durability. We regard the ceiling as of scarcely less importance than the outside planking; and would propose that it be universally adapted to serve similar ends, viz: strength and security from the waves.

Intimately connected with out and inside planking, caulking demands consideration. It completes the job of keeping the water from the hold of the ship. It may be remarked not inappropriately, that the caulking is the test of the planking, inasmuch as the workmanlike execution of one job forms the basis for the other. When the planker has completed his work, it remains for the caulker to begin his; and by a series of well driven threads, to fill the seams with oakum, which, if properly done, renders the external shell firm, unyielding, and impervious to the water. It has often been mooted, how many *threads* of oakum should be driven to complete the caulking. We think it is plain that the thickness of a plank and amount of seam should determine the number, bearing in mind that the opening of seam should in some degree regulate the size of the threads. Double threads are preferable to single, because if *driven* properly, they make

harder work. Filling the seams should be done well with the *caulking-iron*, before the horseing-iron is applied, which should not start the plank upon the fastenings, if these are adequate to a reasonable strain. It is usual to allow one-sixteenth of an inch of seam for every inch of thickness of the planking, and to drive a double thread for every inch of thickness of the planking, and an additional double thread for every five inches; besides this, it has been the practice in navy yards to drive one or two threads of spun-yarn first, as a bottom to the oakum. The caulking should entirely fill the openings between the planks, as it preserves their edges from premature decay; and what is equally important, distributes the strain of the work, and relieves the fastening from the ill effects of pressure at the outer edge of the seam. A vicious mode of caulking injures the edges of the planks, after which the vessels will require frequent caulking, which she will be likely to get with a vengeance after she has left the stocks.

The thicker the plank, the more regular the seams, and harder the caulking, the longer will they remain firm, and the ship be tight. But here we touch again upon progressive ground, and the idea comes forward that to retain the caulking, the ship must first be strong; to be strong, her planking must be thick, narrow, and well secured. Thus we are brought back to the cause of our first observations upon the distribution of materials in the composite portions of the hull. Our present philosophy of timbering and planking is erroneous. Instead of depending on a heavy frame for the sole basis of fastening, both the outer and inner planking should be *chain-bolted* and diagonally strapped from the top-timbers to the floor-heads, and one skin be thoroughly secured to the other; and the ceiling be made, indeed, a *skin*, water-tight and sea-worthy. In advocating the improvements which we suggest, no more timber or fastening would be required than used on the common mode of building, only a higher degree of mechanical skill, and perhaps a trifle added to the cost of labor. And it will not be a digression to remark, that what is spent in skill is invested in profit; and the converse is true, that losses mainly arise from a parsimonious employment of skill. Ships are more profitable now than one hundred years ago, and all is owing to progress in the pursuit of maratime arts. Progress still lies before us.

The waves of progress which roll progressive on our sea of thought, contain the germs of infinite perfection, not only in moral but mechanical philosophy. To remove the shadow of eternal truth, reveals science and perfects art. Suggestions are rounds in the endless ladder of progress, reaching to infinite heights of truth. Such are the evanescent phenomena of the human mind, busied in intuitive workings to improve art and elevate the dignity of human life. By the aid of the press, we are enabled to concentrate the current of human thought, full upon the errors of the past, and, by discussion, obtain light upon our paths. We do not pretend to the

origination of more ideas, or to more practical ones than float on the streams of other mechanical minds; but we exercise the boldness to bring our views to light. In the haste of writing, we would not overreach the mark; but better to escape the cataract than to live in ignorance of its being.

We can conceive of no greater manifestation of human genius, in constructive art, than in the mechanical composition of a perfect ship—a work of art which we do not expect to live to behold. It is the *progress* of our art which gives us pleasure unalloyed. We would, therefore, desire to contribute whatever idea may promise to advance ship-building upon the waves of improvement, and secure to the merchant, the mariner, and the traveler, immunity from the disastrous fortunes of imperfect vessels.

In advocating improvements connected with the planking and ceiling of ships, we cannot close without alluding to a probable cause of foundering at sea. We mean, "starting butts," or losing the oakum from the seams, &c. A weak spot in the planking always exists where there is an assemblage of butts, or where a proper shift has not been maintained. It must be plain that, in order to divide a vessel into several longitudinal sections, it is only necessary to sever the planking from keel to gunwale, inside and out, and it is accomplished. The same thing would be done were the planks of equal length, and the butts of each length worked on the same frame. Thus, if we were to have five lengths of plank, reaching from stem to stern, the ship would be adapted to break into as many parts, and the point of severance would be at the vertical range of butts. It is only by a systematic distribution of butts, therefore, that the integrity of the planking, as an external or internal skin, is maintained. The savage architect of the bark or skin-covered canoe, unites his butts, and *seams*, too, with far more strength than the ship-builder of the present day, and their union is direct. He sews them together with roots, or thongs of hide. We spike, treenail, and bolt to the timbers—a most *indirect* mode of workmanship. The frames are composed of several pieces, whereas they should be *bent*, from one, or two pieces at most, and be confined together by diagonal strapping outside, from keel to gunwale. The evident weakness of the frames of vessels, composed as they are of short lengths, nevertheless, is far less than that of the planking, in proportion to the demands of the structure. It is our belief that more plank are started on the fastening by the *short joints of the frame* than by all other causes at sea united. Any alteration in the transverse shape of vessels, must tend, with all the advantage of a lever over a fulcrum, to start the plank, or to *pry* them off. Each timber of the frame becomes a lever, and each frame-bolt, at the ends of each timber, becomes a fulcrum in a gale of wind. Rolling is, from this cause, the most dangerous motion at sea, and *felt* intuitively to be so. No such danger would await a vessel having her frames made of bent timber or plank. Butts are, therefore, sources of danger wherever found, because points of no strength.

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In planking the war-ship "Niagara," Mr. STEERS scarphed the butts of the lower strakes of planking, by halving them edgewise for the length of three frames, and bolted them. By this means the butts were effectually joined, and will never spring.

But while rolling tends to start the butts, the motion is equally felt to open the seams; while pitching acts to open butts. When, by continual working, the water is admitted to the oakum, it soon softens and destroys the seam, rendering the oakum unfit wholly to exclude the water from the hold. Under such circumstances a *leak* is said to "spring," and if beyond the control of the pumps, "foundering" ensues. Now, if the ceiling were made water-tight, much would be added to the safety of the ship, and, no doubt, the chances would be doubled in favor of safety.

We have not hesitated to indicate the remedy for these faults of construction. We believe a ship *never* should founder at sea, from its violence alone. Let the underwriters, if owners, not fail to investigate the causes of "foundering at sea," and lend their influence to improve the planking and ceiling of vessels.

BULK-HEADS FOR STEAMERS.

THE steamer "Baltic" had bulk-heads put into her hold, after making her last trip from Liverpool, while in this port. This is one step toward security at sea, but a small one, however. These bulk-heads should have been of iron, and doubtless would have been of that material, had it not been that they cost a trifle more. It must not be forgotten that the principle of *the cheapest is the best*, applies to ocean mail steamers as well as to other vessels. Why was not these bulk-heads put in this vessel long ago? Simply because public opinion had not demanded them. And why are they now put in of wood, instead of iron? Why is it that water tanks for vessels are made of iron, and the fire tank, or the incasement for boilers and engines, made of wood, neither fire-proof nor water-proof for any length of time? Iron partitions or bulk-heads are lighter, less bulky, and cheaper, if the safety of life is to be taken into the account. What say the underwriters? It is almost time they spoke out on these questions of safety at sea; the traveling public and the underwriters must settle these questions of safety steamers; how much more comfortable would the people of these United States now feel, were they assured that the "Pacific" had a series of iron bulk-heads dividing her hold into compartments.

COMPARATIVE COST OF TRANSPORTATION PER TON, PER MILE.

From the Report of the New-York State Engineer, January, 1854, we select the following tables, presenting a comparative view of the cost of transporting freight by the various modes at present in use among civilized nations. It will be seen that nature, in the formation of the lubric element of water, has furnished by far the cheaper means of conveying goods from place to place, whether we compute it on ocean, river, or canal. As a highway for nations, the ocean has no rival, its immeasurable capacity is found to be commensurate with all burdens, and a fair exponent of its superior facilities for commercial transit. The winds are also the cheapest of motive powers. Long voyages, and large and fast vessels, furnish the limit of minimum cost and transportation.

TABLE OF COST PER TON, PER MILE.

	Mills.
Ocean—Long voyage	1.0
" Short "	2.4
Lakes—Long "	2.0
" Short "	3.4
Rivers—Hudson, and of similar character	2.5
" St. Lawrence and Mississippi	3.0
Tributaries of " "	5 to 10

	Mills
Canals—Erie enlargement	4.0
" Other large, but shorter	5.6
" Ordinary size	5.0
" With great lockage	6.8
Railroads—Transporting coal	6 to 10
" Not for coal, with favorable grades and curves	12.5
" Steep grades	15 to 25

The following table exhibits the charges on the principal water and railroad lines, according to the last published rates, between the seaboard and the West:

PER TON (OF 2,000 LBS.) PER MILE.

From New-York.	Cts.	Mills.
Hudson River		7
Erie Canal	1	1
Western Lakes, short voyage		5
" " long "	1	
New-York and Erie Railroad	2	4
Hudson River Railroad	3	1
New-York Central	3	4
Western Road, from Buffalo to Chicago, average	2	5
From Boston to Western Lakes.		
New-England Road, from Boston to Rouse's Point	2	7
Northern Road, Rouse's Point to Ogdensburgh	2	
Lake Ontario and Welland Canal		7
Western Road, Boston to Albany	2	3

From Quebec.	Cts.	Mills.
St. Lawrence River and Canal		6
From Philadelphia.		
Pennsylvania Canal to Pittsburgh	2	4
Pennsylvania Railroad to ditto, (estimated,)	3	5
Ohio River		8
From Baltimore.		
Baltimore and Ohio Railroad	3	
From New-Orleans.		
Mississippi River, (lower)		6
" " (upper)		9
Ohio Canals	1	
Wabash and Erie Canal	1	9
Illinois River	1	2
" Canal	1	2

For the transportation of agricultural products and other heavy freights, railroads cannot, by possibility, compete with canals, without ultimate and speedy ruin to themselves. The above rates of costs have been arrived at with great care, and may be considered as correct and reliable as it is possible to make them.

HISTORICAL SKETCHES OF SHIP-BUILDING.

BY A SHIP-BUILDER.

THE sixteenth century closed upon the naval and marine superiority of Spain and Portugal, and left the art of ship-building and of navigation in England in a very depressed state. The successful enterprise of Drake, however, and the fear of the Spanish Armada, aroused the energies of Britain, and she collected a marine force to resist the premeditated invasion, amounting to 197 vessels of various descriptions, of nearly 30,000 tons burden, 34 of which, measuring together 12,600 tons, composed the royal navy. One vessel only exceeded 1,000 tons in size, the largest being as follows:—Triumph, of 1,100 tons; White Bear, 1,000 tons; two of 800 tons; three of 600 tons; six of 500 tons; and five of 400 tons; sixty-six being under 100 tons. The construction and equipment of the Spanish Armada had occupied the whole attention of the Spanish authorities for a space of three years, and yet so imperfectly were naval arrangements understood at that time, even on board the finest fleet the world had ever seen, that the following anecdote, found in Burchett's account of the action of the 23d of July, 1588, appears almost incredible. He says: "The great guns on both sides thundered with extraordinary fury; but the shot from the high-built Spanish ships flew over the heads of the English without doing any execution, one Mr. Cock being the only Englishman who fell, while he was bravely fighting against the enemy in a small vessel of his own."

The Spaniards having the lead of improvements and innovations in marine architecture at this period, appear to have been the first to introduce a third tier of guns, the earliest mention of a three-decker being the Philip, a Spanish ship engaged in the action off the Azores, in 1591, with the Revenge. Sir Walter Raleigh writes, in his spirit-stirring account of this tremendous action, that "the Philip carried three tire of ordnance on one side, and eleven pieces in eurie tire. She shot eight forth right out of her chase, (bow), besides those of her stern portes."

But the English did not follow the example set by the Spaniards, in building large ships; for, during the long reign of Elizabeth, the ships of their navy were not much, if at all, increased in their dimensions; which was probably owing to the triumphant success of her fleets, though composed of ships inferior in size to the enemy's. Shortly after the accession of James to the throne, several commissions were appointed to inquire into the state of the navy. From that of the year 1618, a very voluminous report emanated, from which we extract the following, to show the state of knowledge on ship-building at that time: "The shipps that can saile best can take or leave, (as they say), and use all advantages the winds and seas does afford; and their mould [hull], in the judgement of men of best skill, both dead and alive

should have the length treble to the breadth, and breadth in like proportion to the depth, but not to draw above sixteen foote water, because deeper shipps are seldom good saylers, and ever unsafe for our rivers, and for the shallow harbors, and all coasts of ours, or other seas. Besides, they must be somewhat snugg built, without double gallarys and too lofty upper work, which overcharge many shipps, and make them coom fair, but not worke well at sea. [Very good judgment and reasoning, even at the present day.] And for the strengthening the shipps, we subscribe to the manner of building approved by the late worthy prince, etc., on those points.

"1. In making three orlopes [decks], whereof the lowest being placed two foote under water, both strengtheneth the ship, and though her sides bee shott through, keepeth it from bilgeing by shott, and giveth easier means to find and stop the leakes.

"2. In carrying their orlopes whole floored throughout from end to end, without fall or cutting off the waiste, which only to make fair cabins hath decayed many shipps.

"3. In laying the second orlope at such convenient height that the portes may beare out the whole fire of ordnance in all seas and weathers.

"4. In placing the cooke rooms in the forecastle, as other warr shipps doe, because being in the mid-ships, and in the hold, the smoake and heate soe searche out every corner and seam, that they make the oakum spew out and the shipps leaky and soone decay ; besides, the best roome for stowage of victualling is thereby soe taken up, that transporters must be hired for every voyage of any time ; and which is worst, when all the weight must be cast before and abaft, and the shipps are left empty and light in the midst, it makes them apt to sway in the back, as the Guardland and divers others have done."

The reports and regulations of these commissioners did much to improve the British navy, although the expenses incurred therein were ostensibly the means, in part, in causing the subsequent revolution. The formation of the famous East India Company, which was the act of James I., for the purpose of driving the Dutch monopoly of that advantageous trade out of existence, aroused the nation, and was followed by the construction of the largest English commercial ship hitherto built in Britain. She is reported to have been of the burden of 1,200 tons, or less in size than hundreds of our packet-ships at the present day. The king dined on board, and named her the Trade's Increase. This was about the commencement of the seventeenth century, and prior to 1605. Nor did the royal impetus rest here. The foundation of the "Shipwright's Company," in the year 1605, which was incorporated by a charter granted to the "Master Warden and Commonalty of the Art or mystery of Shipwrights," in the year 1612, took place in this reign. Mr. Phineas Pett was the first master. The draughts for the ships of the royal navy were subsequently ordered to be submitted to this Company for ap-

proval previously to being built from. They also had jurisdiction over all builders, whether of the royal navy or of merchant shipping.

In 1610, the Royal Prince was launched, being the largest and finest specimen of naval architecture ever built in England at this date. The great overhang of bow, a remnant of the old galley of former ages, was discontinued, and the stern and quarters were vastly modernized. She is thus described in Stowe's Chronicles: "A most goodly ship for warre, the keel whereof was 114 feet in length [the length of a 250 ton schooner of the present day], and the cross-beam was 44 feet in length [nearly the width of Collins' steamers.] She will carry 64 pieces of ordnance, and is of the burden of 1,400 tons. The great workmaster in building this ship was Master Phineas Pett, gentleman, some time Master of Arts at Emanuel College Cambridge." The same builder continued the principal engineer of the navy during the reign of Charles. The family of the Petts were the great instruments in modernizing the British navy, by divesting it of the cumbrous top-hamper entailed upon naval ships from the castellated defences found necessary before the use of cannon; and it is probable but that for the taste for the gorgeous decorations of the times, this ingenious family would have done far more in the march of progress. As it was, they decidedly rendered England pre-eminently the school for ship-building during the time they constructed its fleets. This family can be traced as principal engineers for the navy from about the middle of the fifteenth century to the end of the reign of William III. No wonder British naval architecture has been stigmatized as a hereditary science, in which errors have been cherished as family heir-looms, from generation to generation. Peter Pett, a son of Phineas Pett, was the inventor of the frigate, and caused the fact to be recorded on his tomb. This description of war-vessel gave exceeding advantage to the naval prowess of England. The first was called the Constant Warwick, built in 1646, "for a trial of making a vessell that would sail swiftly"—in other words, the first armed "clipper." She was built with low decks, the guns lying near the water, and was so light and swift of sailing, that during the Dutch war she took as much money from privateers as would have laden her. Her dimensions are given as follows: Length of the keel, 85 feet; breadth, 26 feet 5 inches; depth, 13 feet 2 inches; and 315 tons burden. Her "highest number of guns 32, and 240 men."

In 1637 he also built the Sovereign of the Seas, the first three-decker built in England. Her length over all is stated to have been 232 feet, her length of keel 128 feet, her main breadth 48 feet, and her tonnage 1,637 tons, being the same as the Anno Domini of her construction. She carried about 140 guns of various sizes. She was at length razeed one deck, and remained in the service with the character of the best man-of-war in the world, until she was accidentally burned in 1696.

In 1650 appeared the first work upon naval improvement ever written in

England, by no less celebrated an author than Sir Walter Raleigh. He published two discourses concerning naval affairs, which had great influence in creating an interest in ship-building about this period. The models of ships were vastly improved, and the arrangement of topmasts, so that the ship might be relieved of the weight of spars and rigging aloft when occasion demanded, was devised, together with the invention of the chain-pump, which threw twice as much water as the ordinary kind. The weighing of anchors by the capstan, and the consideration of the length of cables required to ride out storms in safety, also was new. The second deck was raised, to give more vent to ordnance, and stanchions were secured under the beams of the decks, for their support. Longer floors were given to ships, and more buoyancy added at the extremities. Improvements were also made in the arrangement of sails.

Studding-sails, top-sails, topgallant-sails, and sprit-sails were devised. Sir Walter writes: "To say the truth, a miserable shame and dishonor it were for our shipwrights if they did not exceed all other in the setting up of our royall ships, the errors of other nations being far more excusable than ours. For the kings of England have for many years been at the charge to build and furnish a navy of powerful ships for their owne defence, and for the wars only. Whereas the French, the Spaniards, the Portugalls, and the Hollanders (till of late) have had no proper fleete belonging to their princes or states. Only the Venetians for a long time have maintained their arsenal of galleyes, and the kings of Denmark and Sweden have had good ships for these last fifty years [since 1600.] I say that the fore-named kings, especially the Spaniards and Portugalls, have ships of great bulke, but fitter for the merchant than the man of-war, for burthen than for battaile."

There were not at this time 135 merchant ships of 500 tons average each in England, although that number had been found in the twenty-fourth year of Queen Elizabeth, but they had the advantage of being far better adapted to commercial purposes. Raleigh calculated that there were in 1650 no less than "400 saile of merchants fit for the wars," besides the colliers of Newcastle, which had the reputation in those days of being the finest sailers and most windwardly vessels in England. Like our own coasting vessels and clippers, in comparison with the larger shipping, these "hoyes," as they were called, were highly prized for their speed and light draught of water, qualities which have ever been held in high repute, and were far superior for usefulness, even in battle, according to Sir Walter Raleigh, than the cumbrous ships of the Royal navy. This eminent authority also denounced very large naval ships, because, "lesse nimble, lesse mainable, and very seldom employed; a ship of 600 tons will carry as good ordnance as a ship of 1,200 tons; and though the greater have double the number, the lesser will turn her broadsides twice before the greater can wend once, and so no advantage in that overplus of ordnance."

We conclude this sketch with a short summary of the comparative qualities of the ships of different nations in the middle of the seventeenth century, from "Fuller's Worthies:" "First, for the Portugall, his carvils and caracts, whereof few now remain (the charges of maintaining them far exceeding the profit they bring in); they were the veriest drones on the sea, the rather because their seeling was dam'd up with a certain kind of mortar to dead the shot, a fashion now by them disused.

"The French, however dexterous in land battles, are left-handed in sea-fights, whose best ships are of Dutch building. The Dutch build their ships so floaty and buoyant they have little hold in the water, in comparison to ours, which keep the better winde, and so outsail them.

"The Spanish pride hath infected their ships with loftiness, which makes them but the fairer markes to our shot. Besides, the winde hath so much power of them in bad weather, so that it drives them two leagues for one of ours to the leeward, which is very dangerous upon a lee shore.

"Indeed, the Turkish frigots, especially some thirty-six of Algier, formed and built much nearer the English mode, and manned by renegadoes, many of them English, being already too nimble-heeled for the Dutch, may hereafter prove mischievous to us, if not seasonably prevented."

W. W. B.

(To be continued.)

EDS. NAUTICAL MAGAZINE:

GENTLEMEN:—Will you permit an old ship-builder to ask your correspondent, "Phineas Pett," to explain how it is that "all known forms used in Naval Architecture move equally well with an equal displacement," as he asserts for a "truth" in his first article? If "all known forms of vessels move equally well," why is there such a *well known* disparity in the performances of vessels?

Pardon me for expressing the wish to see more of this new idea, that any form, or model, (which I suppose to be meant,) is suitable for a ship, providing it is well *proportioned.* Once more, allow me to inquire the difference between a well-proportioned and a well-formed ship?

Yours, in pursuit of light,

"MUNGO MURRAY."

TYPES OF TRAVEL IN THE DOMINIONS OF NEPTUNE.

A DIGRESSION—AMERICAN DIPLOMACY.

Nov. —, 185–.—We have spent ten days in the beautiful harbor of the capital of Brazil, laid in a supply of fruits and more substantial stores, to comfort and sustain us in continuing our cruise China-ward, and we are now getting underway, with a fair though light breeze, which favors the jotting down some of the recollections and incidents of Rio, ere they are blunted by calms and adverse winds.

As seen from deck on the delightful morning we came in, the Bay of Nitherohy, or "Hidden Waters," combined beauty, safety, and convenience, in the prospect fully equal to the Bay of Naples, the harbor of New-York, or any other of the highly eulogised harbors in different parts of the world. English, French, and Brazilian men-of-war were at anchor, and the large fleet of ships, engaged in commerce, which were at anchor about a mile distant, resembled a fine forest in winter.

This delightful bay, the entrance to which is not more than a mile in width, and is overhung on either side by the tops of lofty mountains, is some twenty miles in length, and from ten to fifteen in width. Its bosom is dotted with a hundred islands, and its borders embellished by countless villas; all hemmed in by beautiful mountains, forming a grand and picturesque amphitheatre, which, at once, elicits and commands ceaseless admiration.

Rio, itself, is a city of many hills and valleys, as well as a "city of palaces," as the Brazilians proudly call it. Its public buildings are imposing; its fifty churches, academies, and government houses at a distance, contrast strongly with its nevertheless characteristic Portuguese appearance inside, which, the world over—wherever the Portuguese are—is pretty much the same.

The first surprise which meets one on landing, is that there are no wharves, and especially so, since the shore is so quiet, and covered with an abundance of excellent material for building them. All vessels are loaded and unloaded at anchor in the bay, by means of lighters or *launches* and *falluas*, which are worked by thousands of negroes.

There are no carts nor wagons for the transportation of merchandise. All burdens are carried from place to place on the heads of negroes, or by hand-barrows. Merchants say this means is both more speedy, and more economical. The negroes frequently pass in droves of fifty or more, each with a bag of coffee, weighing near two hundred pounds, on his head, trotting along to the grunting tune of a native song.

The city is regularly laid out into blocks and squares; but the streets are narrow, badly paved, and with side-walks scarcely wide enough for one

person to pass another, without being jostled into a gutter, constantly filled with dirty, offensive water. Riding vehicles cannot pass each other, without bespattering the contents of these gutters on the pavements, and whoever is then passing them. The public squares are grand undertakings, laid out on a large scale, but unimproved. But, in contrast with these, there are two or three large and highly cultivated gardens, which offer delightful promenades, and are much frequented. For so large a city, the hotels are miserable. Pharoux, which has dwindled down to a mere cooking-shop, seems to be a common resort for everybody. The Hotel d'Europa is more select, and most of the naval officers meet there for refreshments. At all the hotels and coffee-houses, a woman, who occupies a little counter in one corner of the room, makes out and collects the bills.

The sleeping apartments at Pharoux are spacious and well furnished, but wo be unto the lodger who retires with greasy fingers or lips!—the cockroaches and rats sport the mansion.

The opera is well sustained.

Free negroes here, as among Portuguese generally, enjoy far greater social privileges than they do anywhere else. Nothing is thought of their intermarrying; and it is no uncommon sight to see a negro girl arm-in-arm with a white Portuguese young lady, taking an "airing" in the public grounds. Some of the representatives in the Chamber of Deputies are negroes, and one of them, at least, is said to be among the most talented members of the House.

AMERICAN DIPLOMACY.

On the day after our arrival at Rio, I procured a carriage and drove down to Caliti, about two miles south of the landing, which is a continuation of Rio, along the shore of the bay, by a broad street, for the purpose of calling on the Hon. David Tod, of Ohio, our Minister Plenipotentiary to the Court of Brazil.

Mr. Tod was appointed under the administration of Mr. Polk. His frank, bland, and ever-courteous manner, rendered him so much a favorite at the Court of Brazil, that he succeeded in getting all our claims against that country, for spoliations on our commerce in the Rio de la Plata, some twenty years ago, in a fair way of settlement. When Gen. Taylor became President, he was not removed, notwithstanding his repeated applications to return home.

The payment of the last balances due the United States, from Brazil, had been arranged by treaty stipulations; but the amount could not be paid over until appropriated by the legislative branch of the government. Mr. Tod waited more than a reasonable period after the opening of the last session, for the preliminary movements of the legislature; he then addressed the Minister of Foreign Affairs on the subject, and sought a conference with

the proper authorities, suggesting a motion in the Assembly to make the necessary appropriation. The Minister's response was unsatisfactory; nor could he obtain any reliable assurance that the appropriation would be paid before the end of the session.

He patiently waited from day to day, until within three days of that fixed for the session to close, when, on the bright morning of the 28th September, he called out his carriage, and drove some four or five miles to the Imperial Palace, "San Christoval," and rapped at the door of Don Pedro the Second. He was informed by the gentleman in waiting, that His Majesty was not yet stirring, that he had not yet left his dressing-room. Mr. Tod requested the gentleman to announce to His Majesty that the American Minister had called thus early on very important matters, and that, with His Majesty's permission, he would wait until it was perfectly convenient to give him an audience. The gentleman waiting made the communication, and returned to the ante-room with the Emperor's reply, that he would soon give the American Minister an audience in person. A few moments afterwards he entered the room alone, and in the most familiar manner bade the minister good morning. He was yet in his dressing-gown, and seemed glad for a moment to shake off the formalities of the Court in his intercourse with the republican representative.

Mr. Tod, after a suitable apology for his informal and early call, begged permission to advert to the subject matter of the late treaty between the United States and Brazil. The Emperor replied, that he would be most happy to have a short conference with him upon that point, when the Minister, in a most respectful manner, referred to the delay of the legislative branch of the government of Brazil, in making the appropriation necessary to a fulfilment of the terms of the treaty, in which it was stipulated that the United States should be paid some three hundred and fifty thousand dollars for spoliations on commerce, reminded him that the session would close in three days, and urged the propriety of immediate legislative action. The Emperor replied, that he felt a deep and lively interest in the matter; nor were his ministers unmindful of its importance, but their border difficulties, and especially their threatened war with Buenos Ayres, which had absorbed the attention of the legislature, from the commencement of the session, had occasioned the delay, and he was fearful that the appropriation might not be made before the adjournment. Mr. Tod begged permission to be perfectly frank on the subject, assuring the Emperor that his language was not that of mere diplomacy, and that he would say nothing which he did not wish to be clearly understood. The Emperor signified his wish, that the interview should be strictly of that character. Mr. Tod then asked His Majesty if he had ever seen the instructions which President Jackson gave to our minister at Paris, some fifteen or twenty years ago, at a moment when it was doubtful whether the French Chambers, then in session, would,

before their approaching adjournment, make the appropriation necessary to fulfil the terms of an existing treaty, by which the government became obligated to pay us 25,000,000 francs? His Majesty replied, that he had not seen those instructions; whereupon Mr. Tod drew forth a copy of them, which His Majesty attentively read.

They instructed, in substance, the American Minister, at Paris, that in the event of the adjournment or a dissolution of the Chambers, without first making the asked for appropriation, he should embrace the earliest opportunity to call in person upon Louis Philippe, the king of the French, and after paying to him the special respects of the President of the United States, make a formal demand, that he forthwith convoke the French Chambers in extra session, for the purpose of making the necessary provision, to fulfil the terms of the sacred treaty by which they were bound. After His Majesty had read and returned it, Mr. Tod very respectfully assured him that the policy of our country, in this respect, had undergone no change, nor could His Majesty fail to see what would be the plain path of duty for him (the minister), in the event of the adjournment of the Brazilian Legislature, then in session, without making the appropriation called for.

Impressed with the frankness and sincerity of the American Minister, the Emperor assured him that the Ministry, as well as the Legislature, should forthwith take the matter in hand. Whereupon Mr. Tod took his leave.

On the day following, the legislative journals chronicled the reference of the subject to the appropriate committee. The next day it was favorably reported on, and the next the appropriation was made.

Owing to the war between Brazil and Buenos Ayres, the Brazilian currency, already depreciated to one-half its original and nominal value, in which the money was to be paid to the United States, was constantly declining, and Mr. Tod saw the necessity of urging the payment immediately that the appropriation was made. He lost no time in collecting it of the Brazilian Treasury, and forthwith forwarding it in available funds to Washington.

It was gratifying to Mr. Tod, *after* he had succeeded not only in securing, but in *collecting* all our too-long delayed claims against Brazil, to receive advice and instructions from our Secretary of State, to pursue the same course in collecting all claims which he had to make.

Mr. Tod is altogether, and in all respects, what he most prides himself on being—an American in its best sense. A native of New-England, and an adopted son of Ohio, which State has repeatedly honored him with some of her highest gifts, he is one of the fairest and best samples of his countrymen. The words of such a man never conceal his ideas, but express them in well-settled opinions, which can be clearly understood and definitely abided by.

MARINE LAW.

LIBEL FOR MATERIALS ALLEGED TO HAVE BEEN USED IN THE CONSTRUCTION OF A SHIP.

In the District Court of the United States, (Boston, July 31, 1854.) Before Judge Sprague. The Abby Whitman, C. F. Gardner, and others, libelants; J. H. Pearson and others, and George Cannon, assignee, claimants.

This was a libel against the Abby Whitman for materials alleged to have been used in her construction, under the Massachusetts Statute, entitled "An act establishing a lien upon ships and vessels in certain cases," stat. 1848, c. 290. The claimants contending that, under the circumstances of the case, no lien existed, even if the materials were so used, a hearing was had to determine this point. The claimants contended that the vessel was built by A. B. for other persons, under a contract with them, by which payments were to be made during her construction, one when she was framed, and the balance on her completion. That the whole amount due by the contract was paid by them to B. on the delivery of the vessel, without notice of the libelants' claim, and that the vessel, under these circumstances, became at least, on the payment made when she was framed, the property of the persons for whom she was built, on the authority of Clark *vs.* Spence, 4 Ad. and Ellis, 448, and other cases; and that if so, or even if there was no such change in the property of the vessel, still there was no lien, under the case of Smith *vs.* the Eastern Railroad, 1 Curtis, 253. They also claimed that the materials in question were supplied on the exclusive personal credit of the builder, and that therefore no lien arose; that there was a credit given by the libelants to him for four months, except as to one item, which was claimed to have been paid, and that a credit for such time showed an intention not to rely upon the lien, as it might extend beyond the period to which the lien was limited by the statute; and further, that by applying certain payments, acknowledged to have been made by the builder, and receipted for on account, in the order of the debts, and allowing the four months' credit claimed, nothing would be due at the date of the libel.

The evidence, so far as material, appears in the opinion of the Court by Sprague, J.—

"He said that so far as the question of property in the vessel was concerned, she was, and remained, until completion and delivery to the purchaser, the property of the builder; that one material element upon which the English decisions rested, he thought, was wanting here, viz.: the fixing any payment or payments at a specific period in her construction; but if that were otherwise, still the authority of those cases was not recognized, and the law was otherwise held here; and that this case did not come within that of the Eastern Railroad.

"As to the lien claimed on the vessel, however, he was of opinion that it did not exist, because the evidence and circumstances in the case showed an intention on the part of the libelants to rely upon the personal credit of the builder and not upon the vessel. This appeared, in the first place, from the libelants' own books, in which all the charges were made against him personally, without any reference to, or mention of, any of the vessels which he was building. Again; the materials appeared to have been taken from the libelants' yard by a teamster employed by the builder, and transferred to his shipyard, while no exertions appeared to have been made by them to ascertain for what purpose they were used, as would naturally have been the case if they intended to claim a lien upon the vessels in whose construction they were employed, the right to a lien depending upon their being actually used in the construction of some vessel; and if they looked to any vessel, they ought to have known in which their materials were used, or to which they were hauled, and would naturally have made inquiries at the time; but no inquiries were made, so far as appeared, and no charge to any vessel.

"Thirdly. When payments were made by B, the builder, as they were from time to time, to the amount of $2,500, there was no appropriation by the libelants on their books, or receipts, to any items to distinguish their claim upon the different vessels, as would be proper, if they intended to claim liens upon them, for it would be material to know which was paid for, and which not, when they should be about to go to sea.

"The fourth circumstance bearing upon this matter was the alleged credit of four months. In itself, that was the most material, but it was mentioned last because there was more doubt in regard to it.

"His Honor reviewed the evidence upon this point, and expressed his opinion that it showed a course of conduct by the libelants inconsistent with the intention to claim a lien, even if it did not, and he seemed to consider that the weight of the testimony was that it did, show such a credit. He was of opinion that the payments made must be applied to the account generally, and not as the plaintiff had claimed, and offered evidence to show, that they should be to other items than those specified in his libel. And he came to the conclusion, upon the whole, that no lien existed, because upon all the evidence, not relying upon any of the considerations mentioned, alone, it appeared to be the libelants' intention to waive it, and rely upon the builder personally.

"The matter of four months' credit he had considered only as bearing upon the general question of a personal credit, because it was not alleged in the claimants' answers as a substantive ground of defence, although conclusive, when properly alleged and proved, if that credit would certainly extend beyond the time limited by statute, and more or less strong in proportion to the probability that it would extend beyond that time, the weight to be given to it depending upon its force, as evidence of an intention not to rely upon a lien. Libel dismissed with costs.

"It seems to be the general impression both in England and France, that the long and slender build of vessels will supersede the rounder and shorter forms, both in sailing vessels and steamers; so says the *London Artizan.*"

We may infer from this that long, deep and narrow vessels, with heavy draught of water, are regarded as the best forms for vessels. How about the gun-boats? Perhaps the remark was not designed to apply to them.

REEFING TOPSAILS WITHOUT GOING ALOFT.

THE discussion on the "Forbes' & Howes' rigs" in this MAGAZINE, has induced a valued corrrespondent to send us a sketch, with specifications of the French rig recently adopted and fairly represented on board of a French ship lying at San Francisco.

The captain of the vessel furnished every facility for obtaining a full description of the operations in port, bearing testimony himself to its good qualities at sea, under every variety of circumstances; adding, that he had been compelled, when struck by heavy squalls, to let fly sheets and halyards, and without any difficulty occurring.

By this mode the topsails are not only reefed, but the top-gallant sails are furled, by the rolling up of the sail on the yards.

The invention of rolling the sail round the yard, which has been tried more than once before, has always had the difficulty of cutting or slatting the sail in the wake of the tie, is in this vessel completely overcome, by placing an apron over it, which slides up and down as the sail is reefed, rolled up, or unrolled. All the iron-work on the yard is made loose, to permit the yard to revolve, except the ratchet around which the chain-tie works to roll the yard over. The sail is reduced and made at pleasure, without sending the men aloft, simply by hoisting or lowering the halyards—the tie being a simple chain that passes round the yard, the links taking in the ratchet, and both ends passing up to the mast-head through two sheave-holes, one below the other, with a hoisting purchase on each end.

It appears to be simple, and well calculated for the merchant service, at this period, when seamen are so scarce, and the necessity for driving ships appears to be considered of so much importance to the merchant. And, inasmuch as our correspondent invites the criticisms of nautical men, extending the privilege to ourselves, we may remark, in advance, that we can discover no feasible objection to its adoption in the merchant service; and will also add, that when the time shall come in which not only the form of rig, but that of the vessels themselves, shall be adjudged of by the standard of *utility*, instead of *antiquity*, then will this or some other improved rig be as well adapted to naval as to merchant vessels.

TO REEF TOPSAILS WITHOUT GOING ALOFT.

SPECIFICATIONS.

The topsail yard is made with an iron ratchet around the centre of it, into which the chain-tie fits. All the other iron-work, such as the straps for the lifts and braces, into which the chafing-booms also fit, are made so that the

yard can revolve easily. The sail is made with a slot cut out of the centre from the head to a few inches below the close reef. (See Fig. 2.) Each side of the slot is tabled with a two-inch piece of rope in the

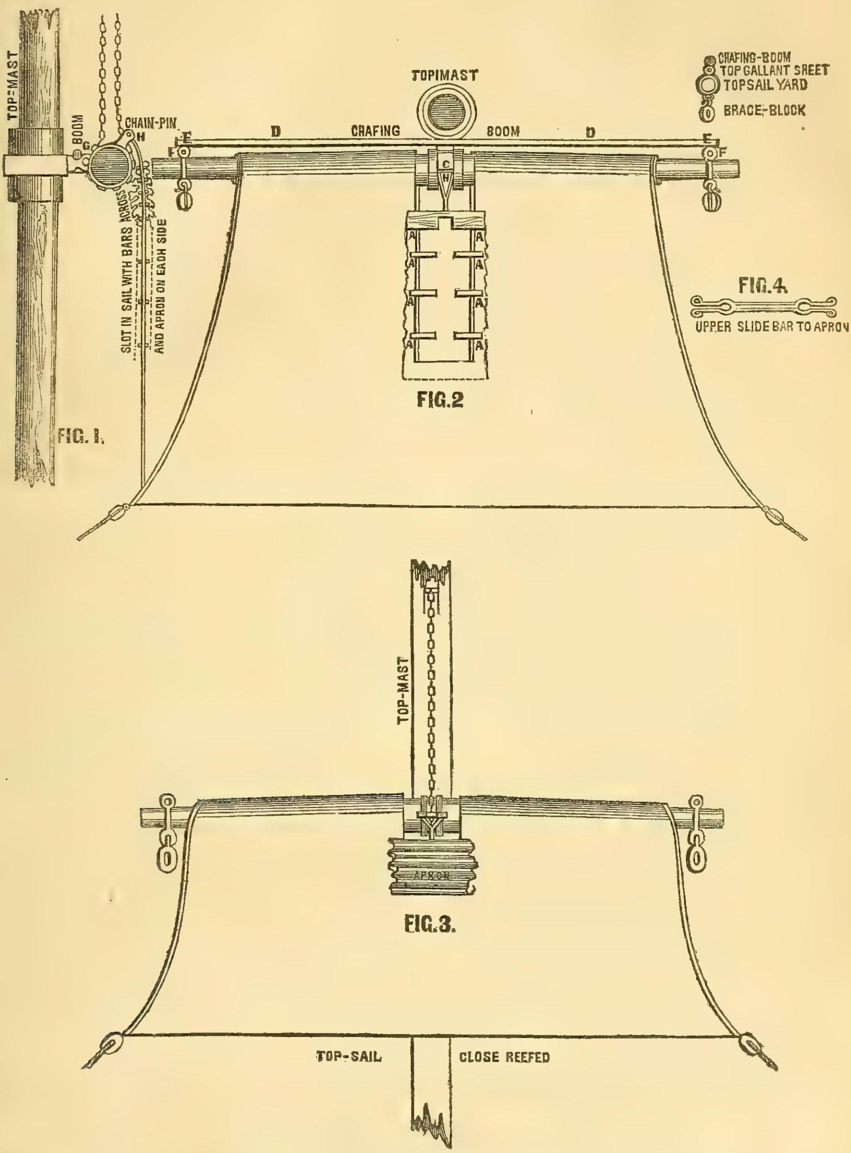


table. Then there are a number of metallic bars, zinc—(Fig. 4.) The first bar extends across, the others are only the *ends of the bars*, stitched to the apron, which extend across the slot and clasp the rope-tabling on each side, (*a a*, Fig. 2.) Then there is an apron, (made of two thicknesses of

canvas,) one forward and the other abaft the sail, stitched fast to the sail about twelve inches below the slot, and then hauled up to the head of the sail, and the bars are (made) seized between the aprons at the distance of ten or twelve inches apart, leaving the edges free, and lapping over the edges of the sail some two or three inches. The upper bar is secured to the band which parrals the yard to the top-mast, and when the sail is hoisted "taut up," the apron is as smooth as the sail, but as it is reefed down, the weight of the bars causes them to drop down to the lower end of the slot, and wrinkles the apron in folds below, as B, in Fig. 3.

PROCESS OF REEFING AND SETTING THE SAIL.

The tie, as I before stated, passes around the yard in a ratchet, (C, Figs. 1 & 2) like that on a capstan for a chain-cable. Both ends of the chain-tie pass through separate sheaves in the mast-head, one above the other.

To set the sail, the yard is hoisted by both halyards at the same time to keep the yard from turning. When the yard is once up, then the forward halyards are belayed with a hitch, and, in case of necessity, the after halyards are lowered away, and the yard revolves and rolls up the sail as much as you think proper.

There are many things which will need greater detail, perhaps, than I have given, for a perfect understanding of them. I simply stated that all the iron straps are made to revolve around the yard; this, it is apparent, must be the case. There is another arrangement, also, which appears to be necessary for the good working of things, which is a chafing boom (D, Figs. 1 & 2.) It is a small boom, with ends fastened into the strap for the brace block of top-gallant sheet (E, E, Figs. 1 & 2.) This describes the mizzen topsail and yard, the brace block being on the forward part of the yard. The top gallant sheet passing through an eye between the boom and the band that goes around the yard (F, F, Fig. 2.) The next thing that requires particular notice is the parral fixtures. There is a broad iron band around the mast, with staves in it about 12 or 18 inches long, to traverse on the mast. This barrel band is connected with the band that goes around the yard by a hinge and swivel, G, so as to allow the yard to brace and move freely. At the yard it divides into two bands, and passes around the yard on each side of the tie-ratchets, and are again joined together by a little bar or chain-pin, (H, Figs. 1 & 2,) which is intended to keep the chain-tie in its place, and cause it to take the better on the ratchet. It has also a socket to receive the inner end of the chafing boom. This boom is necessary for securing the gaskets with which the sail is secured when furled, and they keep the chafe of the sail when rolled around the yard. The foot ropes are also fastened to the irons at the end of the boom.

From the London Mechanics' Magazine.

BRITISH ASSOCIATION FOR THE PREVENTION OF STEAM-BOILER EXPLOSIONS.

In November, 1854, an organization for the above purpose was effected in Manchester, England, and the first annual meeting has taken place. A commendable degree of public spirit has been enlisted in the enterprise, since it appears from their report that 269 firms, employing 920 steam-boilers in their establishments, have joined the Association. Some of the best engineering minds of England have engaged in the movement, which is likely to be productive of vast benefit in securing the great objects of its projectors. We quote portions of the eminently practical and business-like report, as follows :—

" No explosion or accident has occurred in any boiler under the supervision of the Association. The chief inspector has, however, reported several cases of imperfection tending to accidents, and, in particular, has found many flues so constructed as to transmit heat directly to the steam in the boiler, not only when the water is deficient, but when at its daily working level, thus surcharging the steam with heat, and endowing it with one essential element of explosive power, which may be instantly developed by the admixture of water, by agitation, or otherwise. The fact that steam, in contact with water in a quiescent state, may be heated to 500 degrees, or upwards, without any corresponding effect on the steam-guage, or proportionate increase of pressure, appears to be established on good authority. But the precise condition under which the surplus heat thus accumulated in the steam may combine with water to produce explosion, is not fully known ; and your Committee recommend to their successors the investigation of this important point by experiment, as a proper subject for this Association to determine. In like manner, the economical effect, if any, obtained by heating steam in its passage from the boiler to the steam cylinder, for the purpose of gaining pressure by its expansion, demands investigation ; as also the still more important question of the strength of plate-iron tubes or internal flues to resist external pressure, for estimating which no data has yet been made public.

" In the important branch of effecting economy in the raising and use of steam, some progress has been made in collecting facts bearing on the question, and sufficient have been obtained to prove a great waste of fuel in many establishments. It has been ascertained that the consumption of coal for indicated horse-power per hour ranges, in different cases, from three to twelve pounds, and after making every allowance for differences in the quality of coal, and for the employment of part of the steam in heating and other purposes, there remains a vast field for pecuniary saving. It is also found that the waste lies not only in the faulty construction and ill-adapted proportions of furnaces and boilers, but also in the mode of applying and

using the steam when raised. The clouds of dense smoke, indicative of imperfect combustion, testify to the defects of too many furnaces, and indicator diagrams attest in like manner the waste of steam, showing in some cases, in which high and low-pressure cylinders are worked together, a loss of ten pounds or upwards of pressure between the exhaust side of the one cylinder and the steam side of the other. Your Committee look forward with confidence to important improvements in these particulars, by the daily experience in the inspection now acquiring, and in the supervision provided."

From the report of Mr. Langridge, the chief inspector of the Association, we extract the following :—

"This deficiency of water is evidently the most frequent cause of explosion, and as it is important to provide such means of prevention as will be effective in case of negligence on the part of firemen, I would suggest, 1st, The general adoption of open stand-pipes, where application or safety-valves, in connection with a float, to allow the escape of steam whenever the water falls below the fixed limit. 2d. The use of fusible metal plugs, fixed on the top of the flues above the fire. These should stand sufficiently high to melt before any part of the flues could be uncovered with water. The usual practice of inserting a lead pivot or plug in one of the plates is worse than useless, inasmuch as, owing to the inclination usually given in setting boilers, a considerable portion of the flue must be exposed, and may even become red hot before such a lead plug can be melted, under which circumstance an explosion is the probable consequence.

* * * * *

"Although the possibility of surcharging steam, while in contact with water, is still disputed by many engineers in this country, this question was satisfactorily solved by a committee of the Franklin Institute, in America, above twenty years ago. In the report of this committee, it is stated that 'the temperature was carried 533° Fahr., when the pressure shown by the gauge was 6·82 atmospheres; while saturated steam, at that temperature, would have had a pressure of more than 60 atmospheres;' and further, 'these experiments, which lasted more than two hours, show that the surcharged remained in contact with water, without acquiring from it the water necessary to convert it into saturated steam, but retaining its surcharged state.' Several instances which have come under our observation might be adduced in confirmation of the experiments of these gentlemen; but I shall only mention one, which lately occurred, as sufficient for our present purpose. The boiler referred to contained two internal furnaces, uniting in one flue, and had been filled with water to the usual height by a pipe leading from a reservoir. The end of this pipe was about nine inches below the top of the furnaces. About two hours after lighting the fires the steam (being eight pounds, as indicated by the gauge) was turned into the

mill for the purpose of warming it. Shortly after this, the attendant observed that the water had disappeared from the gauge-glass, and was forced back into the reservoir, the valve on the feed-pipe not having been entirely closed. At this time the upper part of the furnaces, above the surface of the water, had become red hot, and the temperature of the steam was such that a block of wood, resting on the top of the boiler, was converted into black charcoal, and yet the pressure never exceeded eight pounds. The communication with the reservoir having been closed, the fire doors opened, and the damper shut, the boiler was allowed gradually to cool; and, although the tops of the furnaces were depressed, no explosion took place. From this it is evident that steam may be raised to a high temperature while in contact with water, and yet remain at low pressure. And this condition can only arise from a deficiency of water in such steam; we may reasonably infer, that if this could by any means be supplied, we should have an almost instantaneous increase of density and pressure proportionate to the degree of saturation. This will fully account for the difference in intensity of many explosions, and why these should so frequently occur immediately after starting the engine, admitting water into the boiler, or lifting the safety valve, all of which tend to produce agitation of the water, and to promote its diffusion amongst the steam. Although this theory of boiler explosions, which was advanced by the late Mr. Perkins many years ago, has not hitherto been generally admitted, certainly the facts which have come under my own observation seem fully to confirm its accuracy."

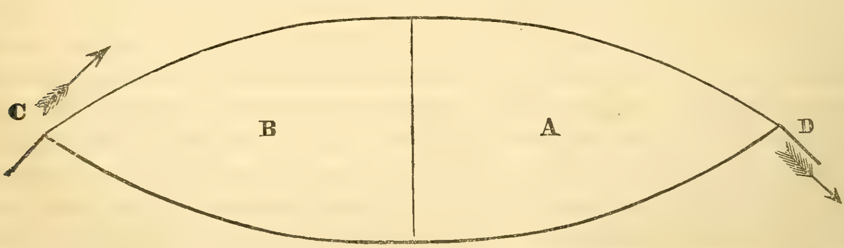
In the course of an interesting speech delivered at the meeting, the chairman stated that he believed it probable that the members of the Association alone paid upwards of £200,000 a year for coal, and that a saving of from £10,000 to £20,000 might be effected in a very short time by the application of principles already known. There was by no means a wasteful consumption of coals in his own concern previously to 1838, but in three years from that time, a saving of 1,100 tons was effected as a result of his reading Mr. Charles Wye Williams's Treatise on Combustion. The consumption had been 20 cwt. an hour, upon the average of three years; but after reading Mr. Williams's work, he caused a certain quantity of atmospheric air to be admitted into the furnaces, instead of having coals constantly shoveled in; and upon the average of the next three years the consumption was only 17 cwt. an hour. He believed there were thousands of firms in this district in whose establishments there was no external supervision, but in which there might be found the same causes of danger that had been detected, and the same wasteful consumption of coal that had been pointed out in the establishments of members of the Association.

THE RUDDER.

To the following from a correspondent, which was unavoidably crowded out of last volume, will be found a reply.

MESSRS. EDITORS :—In your journal of February, in an article upon "The Rudder," the following sentence occurs: "It is, however, a well-known fact among the best informed nautical mechanics, that the anterior part of a vessel is by far the most sensitive, and consequently the most effective locality; in other words, the vessel may be managed with less area of the rudder on the bow than on the stern, particularly if the model of the vessel be full and abrupt at the line of flotation."

Deeming it of importance that philosophers should not be hampered with false "facts," to serve them in their investigations for causes, I have thought it advisable to submit a counter fact to that of "the best informed nautical mechanics," which is, that the anterior part of a vessel is by far the *least* sensitive, and consequently the *least* effective locality; in other words, the vessel may be managed with less area of rudder on the *stern* than on the bow. My experiments upon the subject, during the past year, has demonstrated the fact, that two rudders of exactly the same size, placed one on the bow and one on the stern, when propelled head foremost or stern foremost, always resulted most decidedly in favor of the sternmost rudder—designating it according to the vessel's progress—the rudders being placed at opposite angles, varying from 30° to 45° to the keel. My philosophy led me to believe that a rudder would be *equally* effective at the bow as at the stern, and thought of suggesting the adoption of it, for difficult navigation, in conjunction with the one at the stern; but the stubborn fact presented itself that such was not the case. The philosophy of that fact was not so readily obtained as the fact itself. But as I could not conquer the fact, I was necessitated to fight for the philosophy: here is the result. But to enable your readers to understand the subject better, I shall present it in a diagram.



Let AB represent the fore and after sections of a vessel, bounded by the line of flotation; CD the rudders, at an angle of 45° to the keel. It will be readily perceived that in moving in the direction of the rudders,

as shown by the arrows, which is the point to which the action of the rudders tend, there is a vast difference in the resistance to be overcome in following the inclination of the rudder at the bow, to that which is to be overcome in following that at the stern. In the former case the water meets the swell of the bow at nearly right angles, while in the latter it meets it at about 15° or 20°; the difference between the two not being exactly the measure of the relative degree of effectiveness in favor of the after rudder, because the water coming *directly* against the bow, it piles up in a greater degree, and consequently bars the vessel's progress in that direction correspondingly.

There is another point or two that stand opposed both to my facts and philosophy. The following is one: "The retarding influence of the vessel's progress was directly in the ratio of the width or area of rudder surface," which, if I understand it, means that a wide rudder stands positively at a discount, whether or not it is managed right, or can be controlled with the same facility as a small one. If such is the intent, I must dissent from the position entirely. My philosophy teaches me that a vessel's evolutions are regulated *in point of time*—other things being equal—according to the relative proportion between the rudder and vessel immersed in the water. Thus, if a vessel's rudder is increased in size, her evolutions become more rapid, in the exact ratio of increase of size, *provided* it can be controlled with the same facility; hence the desideratum is, having a rudder so constructed that its increase of size shall be little or no hindrance to the facility with which it may be controlled. "Dividing a rudder vertically in two," *does not*, according to my view, "secure its most efficient action;" but adding another rudder will, most assuredly, and the advantage to be gained in that Patent Rudder is this increase of size, combined with its controlability.

One other remark upon the "stagnant pool on one side of the (old form of) rudder." Small rudders must necessarily have a stagnant pool or dead water on one side; the reason is obvious, *they are less efficient.* In other words, when the vessel's movements are more in the direction of her keel than her rudder, then the rudder carries dead water; but if the rudder could command her circular motion with the same facility that her propelling power commands her direct motion, there would be none. But as that cannot be accomplished by a small rudder, because it must necessarily be placed *at too great an angle*—to become sufficiently effective in bringing the vessel to that position, before her forward movement is spent, whereby her sails will be enabled to finish the work the rudder began—to do so. Dead water evidently bespeaks something wrong, as so much lost speed to the vessel which has to drag tons of water after her. A large rudder or rudder-surface, when controlable, will make a vessel describe the segment of a circle, whose diameter is the same with the rudder, at a less angle to the keel than a small one, consequently it must have less dead water, because it is the resultant of

obtuse angles. Dead water is a concomitant of vessels whose after lines are full and abrupt; for, when her movements are rapid, a partial vacuum is formed which the dead water strives to fill up; the power of this suction is the measure of the resistance to be overcome by the vessel's propelling power. The same laws affect the rudder.

Yours in progressive Art,

R. W.

BROOKLYN, E. D., February, 1856.

In reference to the article referred to by our correspondent, we need only remark, that the stability of our position has not been disturbed, inasmuch as we contemplated a vessel with only one bow and one stern, while he has two of each or two of either, and consequently his experiments must have been on a ferry boat; in addition to which, he *hung the bow-rudder by the wrong edge*, which renders his "counter" "facts" of little value. Inasmuch as his premises are false, his conclusions must be equally so; and it will be only necessary to add that, in reference to the width of rudders, his experience may be worth something, and we may be able to show that ours has also been of some consequence. He informs us in his concluding remarks, that a "large rudder-surface," when controllable, will be "most effective," inasmuch as it "will make a vessel describe the segment of a circle, whose diameter is the same with the rudder, at a less angle to the keel than a small one." The truth of this theory we will leave for our correspondent to reconcile, keeping in view a few "facts" with which we ourselves have been cognizant.

Steamboats' rudders have been increased in width until they had reached the limitation of controllability, and still did not bring the vessel within the provisions of a sensitive helm, when, by reducing the width of the rudder one-fourth of its area of surface, and making its sides hollow, the evolutions were performed in less time, and the steering qualities were all that could be desired—but allow us to add, that the vessel had but one bow, one stern, and but one rudder.—[EDS.

The boilers and part of the machinery for the U. S. Steamer Roanoke, have arrived in Norfolk from the Tredegar Iron Works, Messrs. Anderson & Co., Richmond.

SPANISH QUARANTINE LAWS.

We copy from the *N. Y. Herald*, for the benefit of ship-masters, a translation of the principal articles of the new law of health, or quarantine, sanctioned by the Queen on the 28th of November last:

LAW OF PUBLIC HEALTH.

CHAPTER VIII.

Of Quarantines.

ARTICLE 29. Quarantines are divided into rigorous, and those of observation. The rigorous carries with it the disembarkation and fumigation of the merchandise, enumerated in Article 41, and the fumigation will take place necessarily in a foul lazaretto; that of observation may take place in any of the ports in which there is a lazaretto of that nature, without the disembarkation of the cargo being necessary.

ART. 30. Every vessel proceeding from foreign parts, with a clean bill of health, certified by the Spanish Consular Agent, with good hygienic conditions, and without any suspicious casualties on the voyage, will be admitted immediately to free *pratique*, without other ceremony than the visit and examination, unless official information shall have been received, that at the point or port from whence the vessel proceeds some contagious disease had developed itself.

ART. 32. The clean bill of health from the ports of the West Indies and Gulf of Mexico, and Laguayra and Costa Rica, when vessels shall have sailed from thence, between the 1st of May and the 30th of September, will suffer in our ports a quarantine of seven days for persons and vessels. To the former, time will be counted from their entrance in the lazaretto, and to the latter, from the termination of discharge of cargo. In spite of the clean bill of health, those vessels which may induce suspicion on account of their bad hygienic state, may be subjected to the treatment of a foul bill of health, as a measure of precaution.

ART. 33. The foul bill of health of the plague of the Levant, will be subjected to a rigorous quarantine of fifteen days.

ART. 34. The foul bill of health of the yellow fever, without casualty on board during the voyage, will suffer a rigorous quarantine of ten days, and of fifteen when there have been casualties.

ART. 35. A foul bill of health of Asiatic cholera will suffer a quarantine of ten days, if there has been any casualty on board, and of five days if the voyage has been prosperous.

ART. 36. Vessels proceeding from countries near to, or notoriously compromitted with others which are suffering from yellow fever, or the Asiatic cholera, and vessels from places where the terms of quarantine are less than those fixed by this law, will suffer observation of three days, being subjected to hygienic measures.

ART. 37. The quarantine which may be performed in any intermediate port between that of departure and that of destination, will be deducted

from the quarantine provided in Spain, for the respective bills of health, whenever the same shall be duly certified.

Art. 38. The directors of health, in accord with the boards of health, may adopt quarantine measures against typhus, malignant smallpox, dysentery, and whatsoever other diseases may be imported; but these exceptional measures will be applicable only to infected vessels, and in no case to the country from whence they proceed. No sanitary measures shall ever reach the extent of dismissing a vessel without affording her proper aid.

Art. 39. Days of quarantine will be understood to be twenty-four hours; and as it may happen that in some vessels in quarantine, that suspicious cases of contagious disease should present themselves, the term of quarantine will begin to run always from the day on which all suspicion ceases.

Art. 40. Vessels proceeding from ports which have suffered from the plague, yellow fever, or cholera, will be subjected to the respective quarantines for some time after the cessation of the disease has been officially declared. The time referred to will be that of twenty days in ordinary cases for the plague, and thirty days for the yellow fever, and ten days for the cholera.

CHAPTER IX.

Of Disinfection.

Art. 41. In case of a foul bill of health, and even with a clean bill, if the vessel does not show good hygienic condition, the following merchandise will be disembarked and disinfected in the lazaretto, or in places convenient for the purpose, viz:—Clothes in use, and the baggage of the crew and passengers, hides with hair on and packed hides, fur skins, feathers and the hair of animals, wool, silk and cotton, rags, paper and live animals.

Art. 42. Animal or vegetable substances, in a state of putrefaction, will not be admitted to the lazarettos; whenever they are found in this condition, they will be burned or thrown into the sea. Official and private correspondence will be admitted immediately upon the necessary precautions.

Art. 43. Those parts of the cargo not mentioned in the foregoing articles, will be ventilated by opening the hatches, and placing in them the necessary wind sails.

Art. 44. In the same form as presented in the foregoing article, will be ventilated, cotton, flax and hemp, whenever there has been no casualty during the voyage; but in the contrary case, it will be discharged in the lazaretto, and properly disinfected.

Art. 45. In all the cases mentioned in the second part of Article 42, and in the two following, the ventilated vessel will be afterwards fumigated, and subjected to such other hygienic measures as her state may demand, according to the judgment of the director of health of the port.

Art. 46. In no case will the articles or merchandise of the cargo of the vessel in quarantine be admitted to free *pratique* and circulation whilst the quarantine shall not have terminated, with the exception of metals and other minerals, substances which may be admitted, after forty-eight hours' ventilation on deck. Coin will be received immediately after the proper precautions.

CHAPTER X.

Of Maritime Health Dues.

Art. 47. No other health dues will be exacted in future than those established in the tariff annexed to this law.

Art. 48. Foreign vessels will pay the same health dues as Spanish ones.

Art. 51. The alterations which shall be made in the health tariff, shall not take effect until six months shall have elapsed from their publication, and satisfaction given to the maritime powers.

TARIFF OF HEALTH DUES WHICH WILL BE EXACTED IN THE PORTS AND LAZARETTOS OF SPAIN.

Entrance Dues.

Coasting vessels of over twenty tons burthen, will pay for every round voyage $\frac{1}{4}$ of a real per ton. Vessels proceeding from the ports of the Mediterranean and other ports of Europe, including the coast of Africa, up to the latitude of the Canary Islands, will pay each round voyage $\frac{1}{2}$ real per ton ($2\frac{1}{2}$ cents.) Vessels proceeding from other ports, shall pay each voyage one real (5 cents) per ton.

Quarantine Duties.

Vessels of all classes will pay $\frac{1}{4}$ real per ton each day of quarantine, whether in the foul lazarettos or in observations.

Lazaretto Dues.

Every individual will pay a fee for being in the lazaretto 4 reals (20 cents) per diem. Articles which must be disinfected will pay for the same as follows, viz:—The clothing and baggage of each individual of the crew, 5 reals (25 cents.) The clothing and baggage of each passenger, 10 reals (50 cents.) Hides or skins of cattle, 6 reals (30 cents) per hundred. Fine furs, 6 reals (30 cents) per hundred. Skins of goats, sheep, lambs, and other small animals, 2 reals (10 cents) per hundred. Feathers, hair, long and short wool, rags, cotton, flax, and hemp, 1 real (5 cents) per hundred weight. Large living animals, horses, mules, &c., 8 reals (40 cents) each. Small animals, 4 reals (20 cents) each.

Bills of health will be issued and certified gratis.

NOTICES.

Vessels in quarantine will pay, apart from the foregoing, the expenses occasioned by the discharge of merchandise, it being placed under covers and sheds, and its disinfection. They will also pay the expenses occasioned by the application of the hygienic measures practised before the departure of the admittance of vessels, according to the provisions of the rules, and which the condition of the vessel exacts.

For these operations all possible facilities will be given to the vessels, no expense being made without the knowledge or intervention of the captain, master, or consignee.

Persons who perform quarantine in the lazarettos will pay their own expenses, seeing that the four reals (20 cents) per diem is no more than a duty for their residence.

SHIPWRECK AND LOSS OF LIFE.

It is a source of grief to every philanthropist to contemplate the fearful loss of human life by shipwreck. Within the month of January, 1856, we have the account of 37 vessels having foundered at sea, entailing a loss of 52 human lives. 16 of these vessels were American, 11 English, 5 Dutch, 3 French, and 2 Prussian, a most fearful comment not only on the fragility o nautical fabrics, but of the means of their preservation. An English paper furnishes the following list of wrecks and casualties on or near the coasts of the United Kingdom in 1855; the results shown is indeed deplorable.

"The total number of wrecks and casualties were 1,141, of 176,544 tons. Of the vessels, 963 were British, 11 colonial, and 116 foreign; of which number were totally wrecked 272; stranded and recovered 246; stranded (but whether total or partial loss not reported) 167; totally lost in collision 55; seriously damaged in collision 178; slightly damaged in collision 14; leaky and foundered 49; leaky and put back to discharge and repair 47; destroyed by fire 14; found "derelict" 19; dismasted and otherwise damaged 49; abandoned 20; capsized and sunk 9; seriously damaged by spontaneous combustion of cargo 2. Of these 576 occurred on the east coast, 251 on the west coast, and 117 on the south coast of Great Britain; 127 on the Irish coast, 10 off the Scilly Islands, 6 off the Channel Islands, 34 off the Northern Islands—viz., Orkneys, Shetland and Hebrides; 13 off the Isle of Man, and 7 off Lundy Island. In 1855, the total number of lives lost was 469; in 1854, 1,549; in 1853, 689; in 1852, 920. The number of collisions reported is greatly on the increase, being 247 against 94 registered in 1854, 73 in 1853, and 57 in 1852."

When will this fearful list of miscalled casualties become sufficiently augmented to satisfy underwriters, ocean travellers and mariners, that this waste of life and property is needless? Why not make the ship a life-boat at once?

The MERRIMAC.—We regret very much that we have not been able to obtain an abstract from the log of the very "satisfactory" *trial trip* of this ship from Boston to Norfolk. We have, however, information that can be relied upon, that under steam alone her greatest speed was *nine-and-a-half knots;* under steam and double-reefed top-sails, in a heavy sea, she made *fifteen knots:*—she was tried under sail alone for a short time, but the wind did not favor a fair test. She worked well under all circumstances, and all parties concerned are thus far delighted with her performances.

THE HARBOR OF NEW-YORK.

It is doubtless very generally known, that the legislature of the State of New-York appointed Commissioners to inquire into the subject of Harbor Encroachments, of which so much has been said. That Commission has reported, and the report furnishes matter worthy of the consideration of commercial men. We may learn from this report the reason why there should have been such heterogeneous laws passed in relation to the measurement of vessels. The onerous burdens entailed upon commerce, by the heavy port charges of the old world, based directly upon the tonnage of vessels, induced the construction of a law to evade those burdensome entailments, by representing the vessel to be of smaller tonnage than she really was. Hence the deformities of shape exhibited in vessels built under the old law. The Commissioners, after furnishing much interesting information, which we deem of sufficient interest to publish, came to the encroachment question. They say:

"The government of France has expended fifteen millions of dollars upon the harbor of Cherbourg. Dunkirk, Calais, Dieppe, Marseilles, Havre, Bologne, exhibit various costly works. The breakwater of Plymouth alone cost the English government ten millions of dollars.

"The docks of London are basins excavated on the margin of the Thames, varying in extent from thirty to two hundred and seventy acres, protected by massive walls of hewn stone, and fitted with every appliance for the protection and speedy lading and discharge of cargoes. The present and proposed docks of London comprise one thousand and seventy-one acres in extent, varying from sixteen to twenty-five feet in depth, and costing sixty-five millions of dollars.

"The docks of Liverpool cover an area of six hundred and ten acres, of which one hundred and seventy-four are wet basins, with a quay frontage of over fourteen miles, exclusive of those recently constructed at Birkenhead, on the opposite shore of the Mersey.

"The aggregate amount expended by Great Britain in the construction of docks, during the past fifty years, cannot be less than two hundred millions of dollars.

"During the sixteenth and seventeenth centuries, Holland possessed the carrying trade of the world. The shipping of her ports comprised one half of the tonnage of Europe, and was nearly five times in amount that of Great Britain. The rapid decline of her commercial greatness may be attributed to several causes; but the chief, by the confession of her own statesmen, was the enormous taxation imposed on her trade to defray the debts incurred in her extensive wars. The city of Bristol affords a more recent instance of the fatal effects of excessive port charges. At the middle of the last century, the commerce of Bristol was inferior only to that of London in magnitude; but from the injudicious increase of harbor and dock dues, it was gradually transferred to Liverpool, and Bristol sank into the third or fourth rank of English cities."

For a ship of a thousand tons to go into the port of Amsterdam, remain three weeks, and put to sea again, costs the astonishing sum of $2,100. If

the port be London, the charges amount to $1,340; Liverpool, $1,300; Antwerp, $1,250; Havre, $1,340; Leghorn, $2,000; St. Petersburg, $560. But the port charges of New-York for the same period, amount to no more than $240. This difference is sometimes enough to make a voyage profitable, or the reverse. We copy the following expenses incurred on entering and clearing a ship of 1,000 tons from the port of New-York:

"Pilotage inward, $54; or, if boarded out of sight of Sandy Hook, one third more—$68 50. Pilotage outward, the same. Wharfage, inside berth, $3 a day; outside, $1 50. Custom-house fees, $5 50. Harbor-masters' fee, $15. Health officers, $6 50. Hospital tax, $30 50. Clearance, $5 50.

We add the following by way of contrast:

Actual Expenses incurred on a Ship of 991 *tons Entering and Clearing from the Port of London.*

Tonnage dues	£3	3	8	Brought forward,	£96	18	3
Pilotage in	28	19	9	Pilotage out	£32	10	6
Towing	21	0	0	Custom-house	2	2	0
Watermen	2	10	0	Towing out	38	0	0
Tonnage dues out	3	2	8	Watermen	2	0	0
Trinity lights	34	15	8	Dock charges	70	9	0
Channel do.	3	6	6	Water	6	0	0
Carried forward,	£96	18	3		£247	18	9—$1,335 00

In the year 1700 the exports from New-York amounted to about $50,000, and the imports to less than half that sum. During the Revolutionary war, the annual exports reached nearly half a million, and the imports were more than two millions and a half. In 1823 the exports were over twenty-one millions, and the imports thirty millions. In 1833 the imports were more than sixty millions. In 1854 the foreign commerce of New-York amounted to no less than three hundred and eighteen millions of dollars. It is evident, as the Commissioners remark, that New-York is absorbing the foreign commerce of the United States. Already more than half of the imports, and nearly half of the exports of the country, pass through the narrows of New-York harbor.

"They (the Commissioners) content themselves with stating that estimates of the future, whether founded on the tonnage of arrivals, on the registered and enrolled tonnage of the port, the value of the annual importations, or on the wider basis of the commerce and population of the United States, indicate so great an increase within the succeeding thirty years, as to justify the assumption that before that period will elapse, New-York will surpass any city of the globe in the volume of its trade and the amount of its tonnage."

They further say, that the extension of piers into the East River has increased the rapidity of the current to such a degree, as to render it very difficult to get a large ship into or out of dock without the aid of a steam-tug; and say that it is not worth while to make any change in the East

River. To cut a slice off the end of each pier would cost a great deal of money, and would not do much good.

The fact about the harbor of New-York is, *that there is now a ship afloat that cannot get into it.* That huge vessel which was recently launched in the Thames, and which is expected soon to make a trial trip to the United States, cannot get over the bar at Sandy Hook, because there is not enough water upon it! But the Commissioners say, that

"Vessels *could* enter the harbor through Hell Gate and its neighboring passages, there being more than water enough in them—provided the Gate were improved, and rendered secure by the means pointed out in the Coast Survey papers."

Upon turning to the Coast Survey papers, we find that a comparatively small outlay would be sufficient to remove all the worst obstructions in the channel of Hell Gate. Take, for example, the conclusion of Lieut. Porter's report to Professor Bache. It seems incredible that a passage so dangerous, and yet so easy to be made safe, should have been suffered for two hundred years to remain in its present condition. Lieut. Porter says:

"Bread and Cheese, as it now stands, is one of the most troublesome rocks to avoid in Hell Gate. Heretofore it has had nothing on it to indicate the danger at high water; at low water it shows its entire shape and size. I placed a large pole on the outer point. It is so firmly fixed that it will remain until cut away by the ice. I have been assured that *the pole has prevented many vessels from running on the point;* and I would recommend strongly that an iron spindle be placed firmly upon the same spot, until measures are taken to dock it in. Moreover, I think it advisable to close up *a small eight-feet channel* between Bread and Cheese and Blackwell's Point, *as it is this which causes the most dangerous eddies.* After this is done, a beacon, to be lighted up at night, should be placed upon the outer point, and would, in connection with a light on Mill Rock, be of great advantage to commerce. *At present there is not a single light between New-York and Throg's Point, when there should be at least six.*

"In a place where the interests of so many are at stake, the want of attention to the navigation of Hell Gate appears like culpable neglect. No one can form an idea of the number of vessels that go on shore during the course of a month. Fifty went on shore during the period I was occupied there, (two months), and many of them were much injured. I am convinced that if proper measures were taken to protect the commercial interests of this great city, by blasting the rocks mentioned above, and docking in, as proposed by Lieut. Davis, not one vessel would be lost in five years."

TO PREVENT SHIFTING CARGO.

Among the many causes of shipwreck on the ocean we know of none so hopeless for remedial efforts on the part of the ship's company, when once effected, as the oft-recurring misfortune of shifting cargo. When a vessel is knocked down upon her beam-ends by the force of a gale, and her cargo shifts, in this condition her lot, and the fate of her devoted crew, are alike disastrous. Completely at the mercy of the winds and waves, the poor mariner and his stricken bark seldom avoid destruction. Leaking follows straining and rupture, while the disabled spars and useless pumps in vain beg a truce from the invading foe. How many ships and seamen are annually lost from the results of a displaced cargo we have no means of knowing, for vessels that sail, and are never heard of more, may be numbered by tens and hundreds, from the marine and naval catalogue of almost every commercial country. How many owe their unknown fate to this cause will never appear.

We will not pause to inquire what thoughts engage the last disastrous moments of the doomed mariner's mind, farther than to suppose, that many a sad reflection may have occupied its inventive faculties, if not to discover, at least to deplore the inability of his ship to maintain the stowage of her cargo. It may not have been deemed worthy of a moment's thought on shore, or when pursuing the prosperous voyage, yet we cannot believe but that many a pang has torn the breast of the lost, to *feel* that commercial advancement had not provided a safeguard against the vicissitudes of voyages with cargoes liable to become displaced in contending against the furies of the deep. Man advances only by heeding the admonitions of experience, and by improving upon the imperfections of the past. If there were no errors in the world, and our fathers had already perfected science and art, it might then be matter of astonishment if improvements were suggested in any of the evolutions of human life; yet, how many do we find who live so wholly unconscious of the unfolding condition of civilized man in every class of faculties, and every pursuit of industry, that novelty appears to them as fiction, and invention ranks as humbug. To such the world never becomes indebted for any token of their interest in human weal.

It will therefore be expected, by minds in sympathy with the eternal cause of truth and progress, that much remains to be done in rendering navigation safe upon the seas, particularly in tempest and storm; and not the least that may be accomplished is, to prevent the "shifting of cargo," which may be defined, loss of cargo, loss of ship, and loss of crew. Cured it cannot be. How can it be prevented? We think the means are simple; and truth and wisdom always lie in simplicity. Nothing is more simple than for a stream to tumble headlong over a precipice; yet there is grandeur in Niagara. We trust that our suggestion will not be refused, because it may appear so *easy* to think of.

Let us first premise the nature of cargoes that are liable to shift by extraordinary latitude of motion in a transverse direction. The first consideration is, What are the confining powers of ships' cargoes? It may be answered, that the single force of gravity is all that is relied upon to maintain the position of some description of cargoes in some description of vessels; and it is equally true, that in many vessels nothing but the stanchions under the beams in the hold interpose, to prevent cargo, such as assorted freight, grain in bulk, &c., which does not entirely fill the space of the hold, or between-decks, from obeying the law of gravitation, should the vessel be subject to undue violence in her transverse oscillations, or knocked down on her beam-ends. We say that very many cargoes, and almost all coasting vessels, will be found conjointly liable to experience a shift of cargo, under the above circumstances. It is of vital importance, not only to refrain from overloading vessels which may be exposed to tempestuous weather, but to use such means as will protect them from the danger of changing the position of the centre of gravity of their cargoes.

We only know of one description of lake or coasting vessels which is partially secured from this danger—we refer to those carrying "centre-boards," the trunk of which, for perhaps about one-third of the length between the bulkheads of the hold, reach from the floor to the deck-beams; and we believe that instances of disasters from shifting cargoes are peculiarly rare in this class of vessels. In the wake of the centre-board trunk, it is impossible for the cargo to fall to leeward.

It is notorious to seamen, that, in many cases of being brought on "beam-ends," a ship would again be righted, but for the fact of the cargo having shifted in the interval; and it is no less true that a shifting of cargo, by violent rolling, may be the main cause of losing stability.

It will no doubt have been inferred by the reader, from our remarks on the singular exemption of centre-board vessels from the dangers of shifting cargo, that if a longitudinal partition of the hold and between-decks should be effected, entire security would be given against such disasters at sea. This is what we would propose, only we would denominate such partition a keelson, and construct it with reference to increasing the longitudinal strength of vessels. Whether it should be built of iron or wood, provision might be made for stepping the masts, either on top or astride of it; and we know of no insuperable obstacles to its adoption in any class of vessels. Above all, it should be made water-tight, and valves that could be opened and shut should be provided, to let the water in the hold, or between timbers, run from one side to the other when required, if ever.

We will conclude our suggestions, by describing a mode of providing for the dry-pumping of very flat-floored vessels, without the use of *bilge-pumps*. The writer is now building a vessel having no dead-rise; and he has devised a plan to fill solid and caulk the space between frames and the keel and keelson; thus confining the water to its own side, into which it may have leaked,

and preventing it escaping to lee-ward while rolling, or carrying sail by the wind.

When careened, and it is necessary to pump, the weather-pump only will be worked, as all the water on that side will be lodged against the keelson; and to free the lee bottom, it will only be necessary to tack and again work the weather-pump. Moreover, should the vessel leak, only half the water would find its way to the lee-bilge. It would often be of great assistance to a vessel to confine half the water in her bottom to windward of her keel. The free action of water in a leaking vessel has been the cause of many disasters.

OLD FASHIONED EQUIPMENTS AND INEFFICIENCY, OF THE NAVY.

THE conclusion of our last article under this head, left room for our readers to infer that we would resume its consideration.

Isolated societies seldom improve, and our navy is in such a state. What it requires is an outside pressure from the public, who heretofore seem to have been wholly indifferent as to its condition.

In England or France, any remarks throwing a doubt on the efficiency of an important arm of national defence, if they carried with them the least appearance of truth, would at once cause the greatest excitement. With us they are passed by entirely unheeded—the people not seeming to have the least interest in the question. As an illustration of how slow we are to change—although the English fleet has plenty of both—not a Minnie rifle or Colt's pistol has yet made its appearance in an American man-of-war!

There is not, probably, any one below the rank of captain in the Black Sea fleet, who can easily recall the remote period when all such trash as the capstans, messengers, lightning-conductors, so much treasured in our navy, was turned out of their service. If desirous, however, of refreshing their memories in naval antiquities, they need only visit the American flag-ship, which, although fitted out but a few months since, is actually fortunate enough to possess a full set of these antiquated curiosities—capstan, messenger, and lightning-conductor—all dating from the days of Benbow, and while thrown overboard by every one else, they are retained in our service as mementos of the original discoverers. This is all bad enough, but the excuse is worse—that the improved articles cost too much! as if it were not better to have one ship in a high state of equipment, and fully up to the modern standard, than a dozen whose antiquated appointments would make them a laughing-stock. It can be shown, however, that the money question could have had nothing to do with the non-introduction of an improved capstan. It was altogether due to the inherent inertia of the system; for, without troubling the patent of Brown, there is not now, nor has there been for twenty years, anything to prevent our taking that used during this long period in the French Navy, on the same principle and nearly as good as the

patented one. The fact is, expense has had nothing to do with it, but mere indifference, which has also prevented our adopting the French chain-stopper, which stops a chain when ours cannot, and is not dangerous to the persons using it, while ours is.

We have, to be sure, made a beginning at last, thanks to Congress, for appointing a modern man, Mr. Steers. The Niagara, as well in her model as in the improvements here contemplated, will be fully up to the day; but her sister ship, the Merrimac, under the old regime, is both, in form and outfit, pretty much like her predecessors. And change for the better cannot be looked for until, like the English, we place at the head of the Department of Equipment some sailor of energy and practical experience—the last to be a guarantee that he knows what seamen want, and the first that *ten* years will not be taken to introduce improvements that should be the work of *one*—and cease to consider the hull of a ship of less importance than her engines, by having a Consulting Constructor; we may then see sail-rooms in a convenient position for getting at the sails; the abolition of water-casks; improved methods of stowing a hold, and shot-lockers, which will not be placed where they are usually half filled with water.

Another great evil, and one which requires immediate attention, is that of each commander having the right to say what orders shall be used in the performance of evolutions, and also the power of directing that his crew be stationed in accordance with his particular views, and without reference to any general rule of the service. When it is recollected that our signal book is most faulty and incomplete, it may well be imagined what confusion would result from such a state of things were a large number of vessels acting together.

Since the issue of the Ordnance Instructions this has been a little more attended to, but there remains a great deal to be done yet; too much is left to the individual, and the word *may* is too often substituted for *shall*. That it will not do to leave the efficiency of his ship to the captain alone, is proved by the fact of their seldom doing more than what is strictly required to keep up appearances. We venture to assert, that *there is not a single reliable report of what can be done* with large guns in heavy weather at sea, or even what use could be made of them at considerable distances in a seaway. Naval men talk frequently of a few heavy guns of long range, which are to destroy an enemy's ship when out of his reach, by which it is taken for granted that practice *would be very good.*

The greatest evil of our service is, undoubtedly, the want of practice. What weapons we have we don't use: swords are placed in a ship, but the sword exercise is totally neglected; guns—until recently a captain could scarcely be persuaded to allow them to be fired for practice. Why, we sailed a few years since with an officer, who at that time, after more than nine years' sea service, had never seen a shot fired, and our own experience of several cruises is the same.

What we have always wanted, but more now than ever, as we are gradually introducing a new and larger class of gun, is constant practice at sea, with a certain amount of firing in all kinds of weather, and a strict accountability when orders are given to that effect and not carried out. This independent and isolated action of each captain of a ship, which has been so much the rule heretofore, should be stopped, and the whole Navy subjected to one system to which all must bow; otherwise, in case of necessity, we can never be any more able to organise a fleet from such ill-assorted materials, than we could bring forward suddenly an army fit for a pitched battle, having to draw only on hands of irregular sharp-shooters.

The cause why the Navy is so much behind the spirit of the age and the nation, is principally owing to rank being obtained by age only, and consequently merit, energy and attainments going for nothing. Other nations manage, at least, to get a slight admixture of youth in responsible positions; we do not permit even middle age. This being the rule, and seniority in time bringing promotion, it is only required to wait until the ripe fruit drops of itself—any attempt to reach it by climbing would tire without being of service—so of course few attempt it. Seniority should, undoubtedly, have very considerable rights, but not all. The English never did acknowledge it until *captain*, and finding that not to answer, they have even made a change there. The French system, based on seniority *and* merit, we might adopt to advantage; nor can any possible evil result in our doing so, but much good. As to the cry about favoritism, strict examinations, or the opinion of one's fellows, expressed by vote, would not leave a chance for it; and even were there, we could not lose by the change, having already the very worst system ever invented by human ingenuity for the destruction of spirit and zeal. Were it known that a single commission was to be given each year for remarkable professional attainments, although only one might be awarded, dozens would, in the rivalry, have rendered themselves better fitted for the positions they occupy. Nor do we see why an element which enters into every branch of civil society, might not, with advantage, be introduced into the military system, and that is the *vote*;—confined, of course, to one's own grade. It is now sometimes found of advantage in the selection of captains of tops and other petty officers, and it might well be extended. At any rate, if the Navy is expected to keep pace with the rest of the nation, it must have some of the same incentives to individual exertion, and there must be rewards held out for energy and high professional attainments; and we cannot conceive that examination and the vote of one's fellows, or even pure favoritism, could do more than may very well be done now by the exclusive rule of seniority—that is, to promote the worst man on the list; and even were it to do so he would at least be young, which would imply some exemption from the inherent inertia necessarily consequent on the assumption that increase of years uniformly gives increase of wisdom.

COLLISIONS AT SEA

Another fearful collision has sent a thrill of grief through this commercial community. The catastrophe of the ship John Rutledge, by running into an *iceberg*, furnishes a fruitful subject for every reflecting mind. By the loss of this vessel, one hundred and forty-five souls were left upon the broad Atlantic to shift as best they could, with nothing but the slender hope furnished by the fragile boats, to encounter still greater dangers than had already befallen them. If that forlorn company could have distilled their feelings into language for the press, on exchanging that noble ship for an open boat, a mere *cockle shell*, amid the chilling embrace of icebergs, how loud and lasting would have been their censure against those who by every means have endeavored to hide the necessity of making the ship *a life-boat*, by substituting the fragile open life-boat for the ship itself.

If that clause of our proposed amendment to the passenger law of Congress, passed in 1852, had been acted upon the last session of Congress, this catastrophe would not have occurred, or at least the vessel would have had no passengers on board, which would have greatly relieved this fearful list of deaths. The measure proposed was *this*, "That every vessel should be classified into first and second-class vessels; and *those only which were provided with bulk-heads, dividing the hold of the vessel into water-tight compartments, both transverse and longitudinal, should be regarded as first-class passenger vessels, whether sailing coastwise or oceanward.*"

The passage of such a law would regulate the whole matter. The vessel being then placed under the provisions of the law of Congress, would be subject to inspection as steam vessels now are.

The subject of *safety at sea* should not be allowed to slumber as a secondary interest, while ship-owners and underwriters are computing the advantage *in dollars and cents;* a few hundreds, or even a few thousand dollars, expended in adding security to human life, is of little consequence. The principle that *the cheapest is the best* has been acted upon too long. It is folly to think of slacking the speed of vessels; *be sure we are right, then go ahead, is the maxim of commerce, and of the age.* The fastest vessel will always carry the bulk of the passengers as well as the news, and there is no reason why, with a rigid adherence to the three L's, we may not acquire an average speed of 20 knots an hour for passenger vessels, in moderate weather, in crossing the Atlantic; the shorter the voyage, the less the time of exposure to danger; and the danger of collisions will continue to increase as commerce increases. Shall our steamers be behind sailing vessels in speed? If sail propulsion can secure 18 knots, which it has done, surely steam should do better, or else it would be more profitable to sell the engines and boilers of our steamers for old iron. It would be

well for commercial men to think of this while counting the *extra dollars of cost*, consequent upon making the vessel a *life-boat.* If they would but take into the account the advantage of strength furnished by such improvement, they would discover that, on the score of economy alone, they would save the cost in the diminish of wear consequent upon flexibility. Will any Nautical mechanic, who values his reputation, dare tell us that the Cunard steamer Arabia would have required caulking three times in a single year, if she had longitudinal and transverse bulk-heads in her hold?

We say, and without fear of successful contradiction, that these bulkheads can be made both *water and fire proof*, and that the whole cost will be more than saved in the repairs, during the term of her servitude. The log of the John Rutledge will show, that the most moderate speed promises no security against encountering icebergs, and that the danger is in the ratio of the length of the voyage. Hence, we say, add strength, and safety is increased in like proportion. The commerce of the world is carried on, at the present day, in fragile fabrics, as it regards strength, under the mistaken notion that vessels are strong in proportion to their weight. They require a more mixed construction of wood and iron; and this remark is no less applicable to naval than to merchant vessels. Naval vessels are built on the principle that whatever is heavy and clumsy must of necessity be strong, whether in the model or manner of construction. It is time that the commercial men of the United States made their mark upon the commerce of the world. Let them take lessons from the past, and learn, that those ships which are the most durable and the most profitable, are those which furnish the greatest amount of comfort as well as safety to human life; and we may add, that those ships almost invariably are the fastest, and would always be, if the principles we have set forth were carried out scientifically. For we hold, that tonnage determines nothing in reference to the relative size of vessels. Shape is everything, as a basis in ship-building; and we will add, in this connexion, that all there is of real science in ship-building lies in the form of the vessel, and proportionate amount of, and application to, the propulsory power. Aside from this, all is art. Hence, we say, that, if we may judge from the application of scientific principles to vessels, as now generally modelled and propelled, (not unfrequently with the wrong end foremost), there are but few of the principles of science applied to ship-building; and not only are our sea-going vessels at fault in the manner of their construction, which renders them unsafe as passenger-vessels, but their models are defective for the purposes for which intended.

OUR STATE ROOM.

SUGGESTION TO MR. PETT—FROM A SHIP-BUILDER.

MESSRS. EDITORS:—Will you allow an instructed reader to obtrude a word or two upon your notice. I am pleased to find correspondents presenting their views of marine science in ship-building in your pages. I would like to see every intelligent builder in America doing the same were it possible. I am a builder, but have always left to pens of abler talent the task of portraying the theories of our craft; and I do not now intend to bore you with an essay upon the subtleties of our art. I only wish to say, that I have closely read the papers of your Mr. "Pett," contributed no doubt by an admirer of that ancient enterprising Englishman.

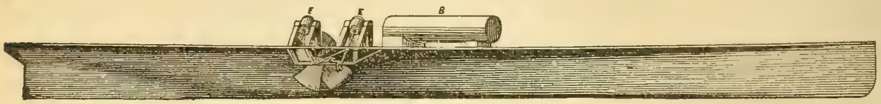
Now, I wish to say, that I am pleased with his efforts to show us a few things in proportioning and shaping vessels, as well as yourselves. I know you both, allow me to add, too well to believe that you would lay a feather in the path of any man striving for the light in progressing architecture; therefore, I expect you will afford Mr. "Pett" an opportunity of complying with a suggestion which it is the object of this letter to make to him through your courtesy. I wish Mr. "Pett" to furnish an illustration of his ideal ship—either a cotton ship, or any other. If he is a draughtsman, as I presume to be the case, he can readily do this; and, gentlemen, please give him a fair opportunity to make his mark upon reforming the shape and dimensions of our ships. A few of his ideas do not appear expressed to the best advantage, but I believe they are good, nevertheless. Mr. "Pett," will you gratify the wishes of an experienced ship-builder—one whose shoulders are old, but whose head is yet young, and give us a view of your *ideal* in the list of engravings, and draughts of the *Nautical Magazine*. I have but one more subject of curiosity. Mr. "Pett" speaks of *Pook's* system of Design, or scale of curves for obtaining the models of vessels. I have never read anything elucidating this system, and would like to learn if it possesses any value. Will not your correspondent, if he pleases, or yourselves, undertake to state the principles and manner of using the above system—set it forth so all can judge of it, in the Magazine. It strikes me, that since we have now a medium of communicating our ideas to, and with the nautical world, it is time we began to profit by it to the fullest extent. Thanking you, Messrs. Editors, for your enterprise and example in the establishment of your *Nautical Magazine*, accept assurances of esteem, from

SHIP-BUILDER.

It will always afford us pleasure to be the medium of offering suggestions and reporting answers to correspondents. With regard to engravings of *ideal* or actual vessels, all which are worthy of a place can find it in our pages. We prefer to have our correspondent ("Pett") furnish "*ship-builder*" an answer in regard to the system of Mr. POOK. We have already adverted to it.—[EDS.

SIDE-SCREW PROPELLERS.

In the second volume of the *Magazine* we furnished a description of the side-screw as a substitute for the paddle-wheel, accompanied with a certificate of the Engineer of the Lake Steamer *Baltic;* we now give place to a letter from the owner of the same vessel to the inventor, illustrated by a miniature engraving showing the manner of its application.



BUFFALO, Feb. 25th, 1856.

CAPT. H. WHITAKER:

DEAR SIR,—In justice to you, I make the following statement of facts, showing the utility of your improvement of side propellers applied upon steamer *Baltic*, compared with the high-pressure paddle-wheel engine taken out of her to give place for the side propeller engines, which has been the mode of propelling her for the last two seasons upon the Western lakes. She has not broken her machinery or met with an accident during the whole time. She now carries double the freight, and runs with less than half the fuel, and at a much higher rate of speed. Notwithstanding her present engines rate 60 per cent. less power than her former engines, she now runs with 45 lbs. pressure of steam instead of 90 lbs., usually worked in her paddle-wheel engines, which reduces the motive power to less than one-fourth of that applied to her paddle-wheels.

The application of side propellers gives great deck room for carrying deck loads, and stability to the boat, that is not obtained by any other mode of propulsion. The Baltic now carries over one-half of her cargo on deck, through all weather, without damage, or meeting with an injury. She has not damaged freight to the amount of one dollar, on deck or in the hold, for the last two seasons, yet she has experienced some of the heaviest gales upon our lakes, with heavy deck loads of freight and live stock, with her wide guards, the same as when a paddle-wheel boat, without meeting with the slightest accident. I now consider her the best freight and stock vessel upon the lakes; whereas, when a paddle-wheel boat, she could not pay expenses. Taking into consideration that the Baltic has the first application of this new mode of propulsion, and that the engines and propellers are imperfect and can be improved, and that her boilers have not the capacity to generate one-half the pressure or quantity of steam required, with the practical experience I have had in the Baltic with your new mode of side-screw propulsion, I am satisfied that it is the best mode of propelling vessels yet known to me.

Respectfully,

ARTHUR EDWARDS.

NEW-YORK YACHT CLUB.

NEW METHOD OF CLASSIFYING YACHTS.

THE Yacht Club, of this city, at its annual meeting in February, appointed a committee of three of its members, viz., L. M. Rutherford, Charles H. Haswell, and James M. Waterbury, to consider the subject of a modification of the existing rules, regarding the classification of yachts competing for prizes.

This committee after several meetings, and upon consulting with several parties experienced in the construction and sailing of yachts, reported to the Club a recommendation that in future yachts shall be classed by the areas of their sails, which, having been unanimously approved of, the committee are now engaged in arranging the details of this system.

The great point is, what differences of trim are to be allowed for differences in canvas.

We have long been convinced that the system by which prizes were awarded to yachts was founded in ignorance of the true principles of science. Nor can we regard the proposed measure with increased favor. There can be no such thing as a test of meritorious qualities for speed, without reference be had to the weight to be carried within a given area of line of flotation and area of sail. Let the New-York Yacht Club now adopt a system that is at least worthy of a name, and it will be the first of the kind that has yet been adopted on either side of the Atlantic.—[EDS.

NEW BOOKS.

The Enlargement of Geographical Science: a consequence to the opening of New Avenues to Commercial Enterprise.

THIS is the title of a paper by Commodore Perry, which was read before the American Geographical and Statistical Society, on the evening of the 6th of March. It treats of the importance to the commerce of the world of increased travelling facilities; the prospects of trade with Japan and China; the great advantages derivable from a circumnavigation of the globe by clippers and mail steamers; the abundant coal fields of Asia; the new avenues to American enterprise which are opening on the other side of the earth; the geography and history of the Bonin Islands, which seem to have been placed in the Pacific, at a point most desirable for "supplies, refitment, or rest," indispensable to a line of ocean steamers from California to China, &c., &c.

This little budget, of 30 octavo pages, has just made its appearance from the press of Appleton & Co., and is eagerly sought, and read with avidity,

in commercial circles. Like his official correspondence in the Japan Expedition, already published by Congress, it evinces indefatigable industry, clear and candid observation, and the most spicy nationality. It also evinces a happy faculty of recording, in the most acceptable manner, matters of fact, which go to establish his reasonable conclusions.

The President of Columbia College, who paid him a handsome compliment in presenting the thanks of the Society, after the paper was read, would have been saved the surprise which he repeatedly manifests "at the finished style in which clear thoughts and suggestions of high moment are conveyed in forcible and graceful words," had he been an officer of that expedition, and witnessed the patient and most laborious researches by day and night, and the unremitting exercise of the Commodore's pen in comparing and arranging a most heterogeneous mass of crude materials, daily gathered from various native sources by the wayside. It is but the reality of the axiom, that "practice makes perfect."

The Commodore's paper breathes the progressive spirit of the times, especially on the subject of "our merchant marine," and the signal contribution "to our naval strength, and to the extension of commerce," which is made by "the wonderful swiftness of our clipper ships and ocean steamers." He is evidently one of the very few veteran officers of our navy who are up with the times—practical and utilitarian. "Whatever (says he, in conclusion,) may be the future changes in the character of our institutions, THE PEOPLE will retain the same SPIRIT OF ADVENTURE and INDOMITABLE ENTERPRISE; and the Pacific Ocean, with its many islands and its frontier coasts, will, ere long, be as familiar to them as are the countries lying on the Atlantic."

The Kedge-Anchor, by Wm. N. Brady, Master, U. S. N. The *eighth* edition of this valuable work, much improved, is a sufficient indication of the public appreciation of its eminent usefulness. The acknowledged ability of the author warrants a speedy exhaustion of this, and an early issue of another edition, containing all the modern improvements. Published by the author, and for sale at the principal book stores.

The Mechanics', Machinists', and Engineers' Pocket-Book of Reference, is an elegantly got up manual, comprehending an unusual amount of the matter treated of, and so arranged as to be of the greatest utility. It is the best book of its kind. New-York: Stringer & Townsend, 222 Broadway.

The Annual of Scientific Discovery—A Year-Book of Facts in Science and Art—edited by D. A. Wells, A. M.—is all that it purports to be. It contains a great amount of useful matter, in every branch of science; and furnishes reliable data on which to base the progress of another year, so concisely, that every one of any pretensions to, or respect for, scientific progress, should be familiar with it. Boston: Gould & Lincoln, 59 Washington-street, and G. P. Putnam, New-York.

Men and Times of the Revolution; or, Memoirs of Elkanah Watson. Including Journals of Travels in Europe and America, from 1777 *to* 1842; *with his Correspondence with Public Men, and Reminiscences and Incidents of the Revolution.* Edited by his son, W. C. Watson. New-York: Dana & Co., 381 Broadway.—This book is well calculated to sustain the laudable fondness and avidity with which every true American seeks but to admire such information as it imparts. It is a valuable contribution to the history of the times.

Confidential Correspondence of Napoleon with his Brother Joseph—2 vols., translated from the French—exemplifies the versatility of talent of the great Napoleon; contributing much to the perfection of history that will be full of interest to his admirers, and to all who are familiar with his life. To such, these letters will be of special value. Appleton & Co., New-York.

The United States, Canada, and Cuba. By the Hon. Miss Murray. Putnam & Co., New-York.

Seaboard Slave States. Olmstead. Dix & Edwards, New-York. These two books are apropos to the same subject (slavery); and are, in a certain sense, first and second volumes. Miss Murray, from her position in English society, had good reason to expect such a reception as she met and showed her merit for in the United States. Acknowledging the error of her preconceptions, she is surprised and delighted throughout her journey. Being sufficiently well read to draw fair comparisons, she graphically describes the many new things that come under her observation, and impresses her thoughts so vividly on the mind, at every step, that each one of her letters seems to lack something which the reader wishes she had seen—that she had dived deeper and brought up more. Her book is the counterpart to Uncle Tom's Cabin. Mr. Olmstead fully makes up for all the deficiencies of Miss Murray. He takes the under-current, and sometimes strips truths so nakedly as to leave an erroneous impression. His comparisons are too far-fetched for fair illustration; and he *labors* to prove the correctness of opinions already formed. The history interspersed with his journey, and remarks on the economy of the seaboard Slave States, however true, is not always pertinent. But statistics on the economy of the Slave States, especially Virginia, are suggestive, and might be much profited by. Both of these books are well worth reading, and *both* should be read by the same persons.

Impressions of England. A. C. Coxe, Rector of Grace Church, Baltimore. Dana & Co., New-York.—A series of sketches among the good people of England, well calculated to make Americans think more of their ancestors, and Englishmen less jealous of their children. The more of such books we have, the more Englishmen and Americans will love one another; and

such books are valuable contributions to literature, because they make men both better and wiser.

The Mormons at Home—By Mrs. Ferris, the wife of the late U. S. Secretary for Utah—Dix and Edwards, N. Y.—contains just as much as it is desirable for anybody to know of the Mormons and Utah—that the very dregs of the vilest sensuality are here building up a second Sodom, which may form the future bed of an extended Salt Lake.

OUR LOG BOOK.

DEATHS.—Surgeon W. P. C. Barton, U. S. N. Capt. F. B. McNeill, U. S. M., 14th ult. Commodore D. Conner, U. S. N., on the 20th ult. Charles Hunter, late Lieutenant U. S. N.

PROMOTION.—A. A. Henderson, to be Surgeon, U. S. N., to fill the vacancy created by the death of Surgeon Barton.

PHILADELPHIA.—Lieut. W. W. Roberts has been detached from the Navy Yard, and Lieut. A. W. Habersham ordered in his place. Lieut. A. B. Jummings ordered to the Receiving Ship.

NORFOLK.—The *Portsmouth* is nearly ready for sea, to be attached to the East India Squadron. Her officers are—Commander, A. H. Foote; Lieutenants, W. H. Macomb, H. K. Davenport, E. Simpson, P. G. Watmough; Surgeon, A. A. Henderson; Purser, ———; Master, S. E. Shepperd; Assistant Surgeon, J. Vansant; Acting Boatswain, Paul Atkinson; Gunner, J. A. Gates; Carpenter, S. G. Myers; Sail-maker, G. C. Boerum.

The *Plymouth* is being fitted for service, to be commanded by Commander J. A. Dahlgren, as a "Practice Ship."

PENSACOLA.—The Floating Dock, Basin and Railway are in order for use, and the Permanent Wharf is so far advanced towards completion that it could be used in an emergency.

NEW-YORK.—The Niagara was placed in the Navy-Yard Dock on the 24th ult.

Ship Germania arrived at this port on the 24th ult., with Mr. Nye, one of the seamen, and supposed to be the only survivor out of over one hundred and forty souls, of the iceberg-wrecked ship, John Rutledge.

DISASTERS AT SEA.

STEAMERS.

Grapeshot, was totally lost near Cincinnati, Feb. 25th.
Yorktown, was totally lost near Cincinnati, Feb. 25th.
Flag, was totally lost near Cincinnati, Feb. 25th.
Madonna, was totally lost near Cincinnati, Feb. 25th.
Black Diamond, was totally lost near Cincinnati, Feb. 25th.
Albertine, was totally lost near Cincinnati, Feb. 25th.
Salem, was totally lost near Cincinnati, Feb. 25th.
Bridge City, was totally lost near Cincinnati, Feb. 25th.
Wisconsin, was totally lost at Mill Creek.
Forrest City, was totally lost at Mill Creek.
Ospray, (propeller,) New-York, Providence, was cut through by ice, Feb. 22.
Caledonia, at Charleston, much damaged by the ice, and leaks badly.
Wm. Jenkins, (steamship,) Baltimore for Boston, got ashore on Fort Bar, Baltimore, March 6.
Henry Lewis, St. Louis for New-Orleans, sunk near Troy, March 1.
Polyphemus, (Br. frigate,) was totally lost on the coast of Jutland, Feb. 29th, 15 lives lost.
Georgia, at Baltimore from Norfolk, much damaged.

SHIPS.

Ocean Rover, Charleston, went ashore near Crosby Point.
Columbia, New-York for Liverpool, went ashore at Huskisson Dock Wall, Feb. 6.
Pilgrim, St. John, N. B., for New-York, put into *Lamlash* in distress, Feb. 5.
James Ray, Philadelphia for Liverpool, put into Savannah, leaky, Feb. 15.
Anna Tift, New-Orleans for Liverpool, put into Havana, leaky, Feb. 13.
Martha's Vineyard, at New-York from Glasgow, lost spars, sails, &c.
Ship ———, Baltimore for New-Orleans, put into Norfolk, leaky, March 2.
Canton, for Rotterdam, was seen, Feb. 12, with loss of masts, and leaking badly.
Louis Napoleon, Baltimore for Liverpool, abandoned in a sinking condition, Jan. 11.
Orion, at New-Orleans from Boston, with loss of some spars, Feb. 1.
Tejuca, New-York for Queenstown, was abandoned at sea
South Carolina, New-Orleans for Liverpool, put back in Distress.
Dirigo, Glasgow for New-York, put back leaky, Jan. 29.
Edward Everett, Baltimore, put into Queenstown, with loss of foremast, &c., Jan. 28.
Holland, Rotterdam for New-York, put into Lisbon, leaky, Jan. 22.
Martha, New-York, is ashore near Dunkirk Harbor.
Victor, St. John, N. B., put into Kingston, with loss of masts, &c., Jan. 26.
Roebuck, at New-Orleans from Cardiff, sprung aleak.
Lavina Adams, Key West for New-Orleans, abandoned in a sinking condition, Feb. 20.
Meteor, Bremen for New-York, put into Fayal, leaky, and with loss of sails, Jan. 31.
J. Elliot Thayer, at Boston from Liverpool, with loss of sails, &c.
John Haven, at Boston from Calcutta, with loss of some sails.
Canrobert, at New-York from Havre, with loss of sails, &c.
Champion, at New-York from Leghorn, with loss of sails, &c., and leaking badly.
Texas, at New-York from Marseilles, with loss of sails.
Splendid, Havre for New-York, put into Bermuda, in distress.
Pioneer, Antwerp for Baltimore, put into Margate, March 8, much damaged.
Corina, New-Orleans for Barcelona, put back leaky, March 3.
Unknown, (Br.,) was seen off Cape Horn, with topmasts gone.
Charles, at Baltimore from New-Orleans, split sails, &c.
Shooting Star, Honolulu for New-York, grounded at Laguayra, Feb. 25, is leaky.
Wm. Chamberlain, at Reedy Island from Liverpool, in distress.

BARQUES.

Morning Star, at New-Orleans from New-York, with loss of sails, &c.
Roanoke, at Queenstown from New-York, is much damaged.
Vickery, Africa for New-York, lost rudder, Feb. 4.
Unknown, was seen, Feb. 27, off Cape Hatteras, with loss of fore topgallant mast.
David Nicholls, sunk at Portland, March 3.
Cotherwood, was wrecked on the Island of Narbro, Nov. 18.

Unknown, (Br.,) was seen in lat. 57° 15′, lon. 71° 53′, with mizzen-mast only standing.
Almira, Cardenas for Portland, wrecked at sea.
Unknown, was seen, Feb. 9, with loss of topgallant-mast.
Phoenix, at New-York from Alicante, lost sails, spars, &c.
Maid of Auckland, (Br.,) Boston for London, waterlogged and abandoned.
Jessie Byrne, Ship Island for Cork, put into Halifax, leaky, Feb. 12.
Roxanna, Newcastle, E., for New-York, sunk in the Bay of Biscay, Feb. 7.
Lenox, at New-York from Batavia, lost bulwarks, &c.
Speedwell, Smyrna for Boston, put into Provincetown, in distress, March 8.
Zetland, (Br.,) Glasgow for Boston, was seen, Jan. 30, in distress.
Alice. at New-York from Rio Janeiro, much damaged.
Douglass, Rio Janeiro for Baltimore, put into Bahia, Feb. 1, leaky.
Tidal Wave, at Boston from Messina, is much damaged.
Hugh Birkhead, at San Francisco from Rio Janeiro, with loss of sails, &c.
Gen. Jones, Lewis, Del., for Philadelphia, lost spars, sails, &c., March 13.
Scio, New-York for Constantinople, put into Gibraltar, in distress, Feb. 16.
Gen. Wiltshire, at Charleston from Liverpool, lost two lives, Jan. 28.
Western Sea, at Boston from Palermo, with loss of jibboom, sails, &c.
Dove, (Br.,) was wrecked, Jan. 10, near Tongoy.

BRIGS.

John Boynton, at New-York from Port-au-Prince, lost masts, sails, &c , Feb. 5
Gen. Wilson, at New-York from Apalachicola, lost part of deck-load, sails, &c.
John R. Dow, Matanzas, sprung aleak, Jan. 17.
Arcadian, Havana for Philadelphia, went ashre at Green Run, Feb. 16.
China, Attakapas for Baltimore, put into Norfolk, in distress, Feb. 19.
Naratiska, St. Jago de Cuba, for New-York, put into New-Bedford, in distress, Feb. 22.
Wm. Nichols, at Charleston from Boston, lost sails, rigging, &c., Feb. 12.
H. Means, Jamaica for New-York, put into Newport, March 5.
Isadora, Rochelle for Philadelphia, put into St. Thomas, Feb. 20, much damaged.
Index, (Br.,) was seen, Jan. 10, a complete wreck
St. Andrew, at Charleston from Rio Janeiro, lost sails, stove bulwarks, &c.
Mary Ann, Georgetown, S. C , for Boston, put into Holmes' Hole, March 3.
Beaver, New-Orleans for Marseilles, put in Norfolk, Feb. 28, with loss of sails, &c.
Velona, Boston for Savannah, put into Norfolk, Feb. 26, with loss of sails, spars, &c.
Susan, Wilmington, N. C., for Boston, put into Addison, Feb. 8.
Sylvina, Venezuela for Baltimore, was total'y lost near Fenwick's Island.
Julia, Georgetown, S. C., for Boston, put back in distress, Feb. 25.
Crusader, Jacksonville for Bordeaux, was abandoned in a sinking condition, Jan. 10.
Washington, Aves Island for Baltimore, put into St. Thomas, in distress, Feb. 9.
Demerara, at New-York from Cardenas, sunk near Bedloe's Island, March 3.
Lucy Ann, (Br.,) at New-York from Halifax, in distress.
Brazilian, at Savannah for Boston, much damaged.
Wheaton, Eastport for New-York, put into Annapolis, in distress, March 4.
L. & W. Armstrong, at New-Haven from Guayama, P. R., lost deck-load, &c., March 2.
Allston, Attakapas at Baltimore, with loss of sails, &c.
Clipper, (Br.,) at New-York from Jamaica, with loss of sails.
Richmond, Gonaives for New-York, went ashore on Great Inagua, Feb. 12, total loss.
Sarah Thorndike, Boston for Jacksonville, put into St. Thomas, in distress, Feb. 1.
Neptune, Baltimore for Havana, wrecked on Bahama Banks.
Gen. Washington, (Br.,) for Wilmington, was towed into Delaware Breakwater, with loss of sails, March 10.
Lucy H. Chase, Wiscasset for Cuba, abandoned in a sinking condition, Jan. 8.
Vesta Ellen, St. Domingo for Boston, lost deck-load, Dec. 15.
Shibboleth, at Holmes' Hole from Cardenas, with loss of a part of deck-load.
Tarratine, at New-York from Tobasco, with loss of jibboom, sails, &c.
Unknown, (or Schooner,) was seen off Egg Harbor, with both top-masts gone, March 11.
Venus, Chesapeake Bay for Boston, went ashore on Nantucket, March 15.
A. Hayford, at New-York from Port-au-Prince, split sails, &c.
Capt. John, Mobile for Cardenas, sunk in Mobile Bay, March 13.
Leontine, Havana for Boston, at Bermuda, leaky, and with loss of sails, &c.

SCHOONERS.

Mayflower, Georgetown, S. C., for Boston, abandoned in a sinking condition.
Sarah Burton, at New-York from Porto Cabello, with loss of sails, &c.
Louisa, at New-York from Attakapas, with loss of boat, jib, &c.
Sarah Maria, at New-York from Barcelona, with loss of sails, &c.
Alfred Storer, at Charleston from New-Orleans, with loss of masts, and leaking badly.
Richard Anderson, at Charleston from New-Orleans, leaks badly.
Storm King, Rio Janeiro for Baltimore, put into Hampton Roads, Feb. 17.
James Bliss, Bucksville, S. C., for Kennebunk, put into Boothbay, with loss of sails, &c., Feb. 24.
Mary, at New-Orleans from Ruatan Island, lost sails, &c., Feb. 8.
Nantucket, Boston for Darien, put into Georgetown, S. C., in distress, Feb. 18.
Lucullus, St. Mary's, Ga., for Pembroke, Me., went ashore on Block Island, Feb. 3.
Myers, New-York for Frankfort, put into Gloucester, Feb. 28.
Wm. Carroll, James River for Boston, went ashore near Provincetown, March 5.
Louisiana, Newburyport for Philadelphia, went ashore on Strait's Mouth, Id., Feb. 27.
Wm. Schriver, at New-Castle, Del., sunk, Feb. 8.
J. W. Faulklin, Boston for New-York, put into Newport, in distress, Feb. 25.
Adelaide, Attakapas for Richmond, put into Norfolk, with loss of sails, Feb. 23.
Cumberland, for Alexandria, put into Norfolk, Feb. 13, much damaged.
Lochiel, at New-Bedford from Darien, Ga., lost part of deck-load, &c.
Dazzle, at St. Thomas from Martinique, in distress, Feb. 11.
Romp, Prince Edward's Island for Boston, went ashore in Yarmouth Sound, Feb. 19.
H. D. Grindle, put into St. Thomas, Feb. 2, in distress, with loss of sails, booms, deck-load, &c.
Cabot, (supposed,) New-York, arrived at Fall River, much damaged.
Citizen, for Portsmouth, N. H., put into Boston, with loss of jibboom, &c., March 7.
Elizabeth & Eleanor, Aspinwall for Balize, Hond , put into Mobile, leaking badly.
Dorchester, for New-Haven, sunk off Miller's Place, March 4, 2 lives lost.
Lejok, Attakapas, went ashore near Tinicum, March 1.
Mora, went ashore on Bullock's Point, and is much damaged.
Streamlet, Norfolk for New-York, sank, March 6.
Jesse W. Starr, at New-York from Port-au-Prince, with loss of deck-load, &c.
Unknown, dragged on Swan Point, near Baltimore, and sank, March 7.
Frances, Newfoundland for Boston, in contact with brig H. Newell, and sank, March 1.
Eliza, Rio Janeiro for New-York, put into Norfolk, March 10, in distress.
O. Francis, at Charleston from Boston, with loss of bulwarks, &c.
E. Barnard, lost sails, deck-load, &c., off Tampico, Feb. 20.
Clark Cottrell, Porto Cabello for Baltimore, lost sails, &c., March 6.
E. W. Farrington, New-York for Mobile, put into Norfolk, in distress, March 4.
Eckford Webb, (Tern.) at Glasgow from New-York, with loss of masts.
Hyderanger, Pensacola for New-York, put into Holmes' Hole, leaky, split sails, &c., March 8.
Martha, Florida for Indianola, was lost, crew suppcsed to be lost.
Sarah Smith, Eastport put into Edgartown, leaking badly, March 13.
E. W. Gardiner, Charleston for New-York, put into Norfolk, March 14, with loss of sails, &c.
Julia Frances, Beaufort, N. C., for New-York, put back in distress, March 10.

LAUNCHES.

At Bath, Feb. 21, by Berry, Richardson & Co., ship Commodore, about 1,100 tons.
At Bath, Feb. 21, by Messrs. Moses, ship William V. Moses, of about 900 tons.
At Rockport, Me., Feb. 20, by Merriam, Crocket & Co., schooner Snow Squall, 75 tons.
At New-York, by Rosevelt, Joyce & Co., barque Exchange, 550 tons.
At Baltimore, March 8, a schooner of 125 tons.
At East Boston, March 8, ship Ceylon, of 750 tons.
At Kennebunk, March 8, barque Waverly, 500 tons.
At New-York, by Wm. H. Webb, a barque of 700 tons.
At Bath, March 8, by Trufant, Drummond & Co., a ship of about 1,200 tons.
At Bath, March 6, by Wm. M Rogers, ship Montmorenci, about 1,000 tons
At Baltimore, March 6, by Sanks & Riggin, a herm brig, 100 feet long, 25 feet beam.
At Cape Elizabeth, by Turner & Foster, the brig Grenada, of 255 tons.
At Portsmouth, by Tobey & Littlefield, ship Anna Decatur, of 1,050 tons.
At Bath, March 13, by Lawrence & Moses, ship Southern Eagle, 650 tons.
At Greenpoint, N. Y , by Eckford Webb, schr. Hartstein, of about 700 tons.
At New-York, barque John J. Palmer, 550 tons.
At New-York, ship Shepherd Knapp, 750 tons, Feb. 27, by Westervelt Ship-building Co.
At New-York, by W. H. Webb, ship J. H. Elliot, dimensions 172 by 36×23.
At New-York, brig Alice Tainter, March 13, 140 by $32 \times 17\frac{1}{2}$, by W. H. Webb.

NOTICES TO MARINERS.

Gunfleet Light-house, East Swin, England.—The following notice has been received at the Office of the Light-house Board, from the Trinity House, London:

"The Pile Light-house which has been erected near the edge of the south-eastern part of the Gunfleet Sand, in the East Swin, off the coast of Essex, being now complete—

"Notice is hereby given, that a *revolving* light, colored *red*, will be exhibited therein at sunset of the evening of Thursday, the first of May next, and thenceforward continued nightly from sunset to sunrise.

"Notice is also given, that the lights at present shown on board the *Gunfleet light-vessel* will, on the said 1st of May, be *discontinued*, and the Balls struck; and also that the beacon which stands a short distance to the westward of the new light-house, will thereafter be taken away.

"Masters of vessels, pilots, and other mariners, are hereby strictly cautioned not to approach the lighthouse nearer than a quarter of a mile, nor, under any circumstances, to attempt to pass to the northward thereof."

Washington, Feb. 13, 1856.

Revolving Light on Troubridge Island, South Australia.—Official information has been received at the Office of the Light-house Board, that the Harbor Authorities at Port Adelaide, South Australia, have given notice that a new light would be established on Troubridge Island, St. Vincent gulf, on or about the 1st January, 1856.

The light is *revolving*, showing a bright light (which lasts for twelve seconds) every *half minute*. When within a distance of about seven miles, a continued faint light will be seen, in clear weather, between the intervals of the brighter light. The illuminating apparatus is catoptric or reflecting, and of the 4th order.

The light is placed at an elevation of 80 feet above the level of the sea, and will be visible from the deck of a ship, in clear weather, about 16 miles. The light-house stands in the centre of the island, in lat. 35 7 50 S., lon. 137 52 E. of Greenwich.

Directions.—Vessels bound through Investigator strait into St. Vincent gulf should make Troubridge light on a N. E. ½ N. bearing, and steer E. N. E. ½ N. to pass it at a distance of 7 miles, bringing it to bear W. by N. ½ N.; thence a course N. E ½ N. 30 miles, will reach a berth 2 miles southwest of Port Adelaide light-ship, when heave to for a pilot or steamtug.

Vessels from the westward and southward should not approach the Troubridge light nearer than 4 miles, where they will find soundings in from 10 to 14 fathoms.

Vessels bound down the gulf in westerly gales, will find good anchorage under the lee of Troubridge island, with the light bearing S. W. about 1½ miles distance, in 8 fathoms, over a clean sandy bottom.

Courses and bearings are magnetic. Variation, 5 deg. E.

Washington, Feb. 26, 1856.

Courtown Cays, Mosquito Coast.—The following notice has been received at the Office of the Light-house Board, and is published for the benefit of mariners:

"Information having reached the Admiralty, that the grove of cocoa-nut trees, which, in the year 1832, existed on the middle Cay of the Courtown Cays (lying 15 miles E. S. E. of St. Andrew's, off the Mosquito coast,) is no longer standing, having been either cut down, or blown down in a hurricane,

"Notice is hereby given, that the words 'Grove of Cocoa-nut Trees,' written against the said Cays in the Admiralty charts, as well as in many other charts of the West Indies, should be expunged, and the said trees must not be looked for by the navigator. The name 'Cocoa-nut Cay,' on the charts, is also to be changed to Middle Cay.

"As it is not an uncommon occurrence in the West Indies, and generally in the region of hurricanes, that cocoa-nut trees are so blown down, (as was observed in the Barbadoes hurricane of 1830,) the mariner is warned to be on his guard, and to remember that it is not a safe practice to run for low cays or sand-banks, expecting to see trees which may no longer exist.

"Middle Cay lies in lat. 12 24 N., lon. 81 28 30 W. of Greenwich."

Rathlin-o-Birne Light-house, Northwest Coast of Ireland.—Official information has been received at the Office of the Light-house Board, that the Port of Dublin Corporation has given notice that a light-house has been erected on Rathlin-o-Birne island, county Donegal, from which a *light* will be exhibited on the night of the 14th day of April next, (1856,) and thereafter will be lighted during every night from sunset to sunrise.

Rathlin-o-Birne Light-house is built on the outer point of the island, which is situate off the most western promontory of the county Donegal, in lat. 54 39 47 N., and lon. 8 49 52 W.; bearing

From Malinmore Head, S. W. ½ W. distant 2½ nautical miles.
From Carrigan Head, (*Donegal Bay,*) N. W. by N. distant 5¾ nautical miles.
From Seal Rock, (*Sligo Bay,*) N. by E. distant 19 nautical miles.

The light will be a flashing light, (*fixed, varied by flashes,*) giving a *flash* once in every 20 seconds, and in clear weather will be seen at the distance of about 16 miles; its focal point being 116 feet over the level of the sea at high water. The light will be visible all around, and from seaward, will appear of the natural color, *bright* between the bearings of S. W. ½ S. and N. N. W. ½ W., but will be colored *red* towards the mainland and sound eastward of the island.

The tower—65 feet in height from base to summit—is circular, having a dome-formed top, which, together with the blocking under light-room, will be colored *red.*

Vessels, unless when piloted through the sound, should be kept outside the limits of the *red* color of the light.

Tidal reefs extend ¼ of a mile off the west side of Rathlin-o-Birne.

The bearings stated are magnetic. Var. 20 deg. W.

Washington, Feb. 28, 1856.

Upper Jettee Range Lights, Cape Fear River.—A fixed light of the natural color will be exhibited, for the first time, on the evening of March 1st, 1856, on a house recently erected on the east bank of Cape Fear river, 3 miles below Wilmington, N. C.

The illuminating apparatus will be a 6th order lens, placed in a lantern on top of the keeper's house, and having an elevation of 42 feet above the mean level of the river. The house is a wooden structure painted white.

On the same evening will be exhibited, for the first time, a beacon light of the same order, distant 800 feet from the front light, and bearing N. 9 50 east.

The beacon is an open frame, painted white; 20 feet square at bottom, and 8 feet square at top, surmounted by a closed lantern, at an elevation of about 65 feet above the level of the river.

The two above described lights make a range, passing about 150 feet west of the head of the Upper Jettee, on the east side of the river, and also along the channel, beginning about one mile below, and ending about 1½ miles above the Jettee.

Flashing Light on Sylt Island, Coast of Sleswig.—Official information has been received at the Office of the Light-house Board, that the Danish Royal Navy Department has given notice that a new light will be established near Röde Klif, on the Island of Sylt, off the coast of Sleswig, on the 1st March, 1856.

The light will be a fixed light, with a flash every fourth minute, visible all round the horizon, but it will show brightest to seaward from S. S. W. round by west and north to E. N. E. It stands at a height of 200 feet above the mean level of the sea, and may be seen, in clear weather, at a distance of 20 miles.

The illuminating apparatus is catadioptric of the first order. The light tower is round, of brick, and 116 feet high. It stands in lat. 54 56 51 N., lon. 8 20 30 east of Greenwich.

In the direction of Listerdyb, from N. by E. ¼ E. to N. E. ½ E., the light will be faintly colored red.

All bearings are magnetic. Var. 20 deg. W.

Cape Elizabeth and Wood Island Light-houses.—Notice is hereby given, that on the 1st of April next, the light at present on Cape Elizabeth, will be changed, so that there will be shown on that night, and during every night thereafter, a fixed light in the tower of the light now in use, and a revolving light in the tower of the old revolving light.

In coming from seaward, the revolving light will, in all cases, be made before the fixed one. Therefore to diminish the danger of mistaking Cape Elizabeth light for Wood Island light, which is a revolving light, the latter will be changed, on the 1st of April next, to a *red* revolving light.

After that date, vessels coming from the westward will first make Wood Island, showing a *red* revolving light, and then Cape Elizabeth lights, showing two lights of the natural color, one fixed and the other revolving.

Portland, Feb. 29, 1856.

Light-vessel off Martin's Industry, South Carolina.—A new light-vessel has been placed off the Martin's Industry Shoal, in the same position as the old one. She is schooner-rigged, with a red day mark at each mast-head. Her hull is painted red, with the words, "Martin's Industry," in large white letters, on each side

Until the 15th inst., (March, 1856,) she will show one bright white light, at an elevation of 40 feet above the level of the sea. After that date, she will display two lights—one at each mast-head, which, of a clear night, should be seen at a distance of 11 nautical miles, from the deck of the vessel 10 feet above the water.

Savannah, Ga., March 1, 1856.

Ministry of the Interior, Greece.—Navigators are informed, that after the 13th March, proximo, a lantern of the 6th class will be lighted during the whole of the night, on the light-house erected on the point of the small island of Psitalia, (Lipsocontala,) situate 2 miles westward,

and opposite the port of Pyrens; the entrance to that port, as well as to the Roads of Salamina, are completly lighted by the light in question.

The small light provisionally established on the spot, to the right of the entrance of the port of Pyrens, near to the Tomb of Themistocle, will be taken away the same day, to avoid all confusion.

Athens, 26th January, 1856.

Hydrographic Notice.—The Northern Beacon of the Martin Garcia Channel, that was situated $2\frac{1}{2}$ miles S. 63 deg. E. (magnetic) from the Farol, disappeared in the gale of the 28th of October.

The want of a fixed leading mark, that would render a navigator independent of beacons, and at the same time ensure the deepest water between the Sta Anna Bank and the Middle Bank, must long have been felt desirable.

Lieut. Sidney has the satisfaction to announce that he has established a mark for that purpose.

A stone beacon on the S. E. end of the island of Martin Garcia, on a clear green patch of ground, has been erected and whitewashed.

This beacon kept carefully in one with the Farol Post (over the western end of the barracks), will clear the banks on both sides, and lead through in the deepest water.

This mark may be made available after entering the channel from the Flats, when abreast of the Southern Beacon on the Sta Anna Bank, 5 miles from the inland, and continued until within a mile and a half of the island.

This mark, therefore, will dispense with the neceessity of displacing the missing beacon, as it would also of the two below it, should they break adrift.

The channel, inside of the Middle Bank, has been reported to be a bolsa, or saca, with no outlet, by the pilots; either on account of its former junction with the main channel to the southward having filled up, or from their not being aware where it now joins it. It is 4 miles from the S. E. end of the island, and a buoy or beacon placed on the south end of the Middle Bank, would indicate the opening of this channel, and lead into a wider and deeper channel than the one between the middle ground and the Sta Anna Bank.

Mr. Sydney has also carefully examined the banks to the eastward of the Sta Anna Bank, and has found a channel leading to the deep channel called "Channel de Infierno." The difficulties of this channel extend only for $2\frac{1}{2}$ miles, between two sand ridges, in which three beacons or buoys would clearly indicate the passage, and would carry thirteen feet through at a mean low tide.

The principal difficulty, however, in the navigation of the Parana Channel below Martin Garcia, has, I conceive, been removed by the erection of the beacon mentioned, and it cannot be too widely known. It is also recommended that the beacon be kept occasionally whitewashed.

The addition of a vessel moored on the Flat, in such a position as to ensure a ship's falling into the main channel at the proper place, would be very desirable, and much facilitate the navigation of those parts.

F. W. Sidney,
Lieut. R. N. and Admiralty Surveyor, Buenos Ayres.

New Shoal.—Captain Booth, of the bark Vickery, reports while on his passage from Pernambuco to Little Fish Bay, Coast of Africa, passed over a shoal on the southwest coast of Africa, not laid down on any chart in his possession. Capt. Booth says:

"The shoal lies in lat. 18 10 S., lon. 10 24 E. from Greenwich by my chronometer (corrected six days after the occurrence). I sounded and found nine fathoms; sounded a third time and found seven fathoms, and not wishing to find any less water, I did not sound again. I was going about nine knots at the time, and there was a very heavy swell, which caused me to sound. While bracing my yards and hauling up, I saw a rock a little way off to leeward, but not wishing my people on board to see it, I did not point it out. The rock was pinnacle shaped, and I do not think it could be seen in smooth water, as it was only between the rollers that I saw it. I supposed myself, after obtaining three soundings, near to Cape Frio, until arriving at Little Fish Bay. While going into Little Fish Bay, I struck on a shoal and knocked off a part of my keel, and unhung my rudder, and broke the pintles of the same, which might have made a difference in my chronometer. This shoal I believe is not generally known. They are not laid down on the charts that I have; and I believe that I have the latest editions. They should be made known as they lie directly in the passage, or the latter one does, while going in from the south to Little Fish Bay. I was detained there some time, and while there I got the bearings of the principal points and the shoal likewise. The shoal lies from a mile and a half to two miles from shore."

Warsaw Bar.—The following buoys have been placed at Warsaw bar:

Outer buoy, just outside the bar, in 13 feet at low tide. This buoy is a second class iron can-buoy, painted red, with the number 2 in white, and must be left on the starboard hand in entering. North point of Warsaw bearing W. by N. $\frac{1}{2}$ N.; beaconlight at Tybee N. by E. $\frac{1}{2}$ E.; inner buoy N. W. by W.

The inner buoy is placed on southern edge of north breakers, in 20 feet water at low tide. It is a third class iron can-buoy, painted red, with the number 4 in white, and must be left on starboard hand in entering, north point of Warsaw bearing West, outer buoy No. 2 bearing S. E. by E.

Note.—In running in for Warsaw bar, keep the north point of Warsaw, bearing W. by N. ½ N., until you make the outer buoy, leaving it on the starboard hand; then N. W. by W. until up with the inner buoy, which leave on the starboard hand; then haul up for the north point of Warsaw; the water is bold near the beach.

At St. Catherine's north bar channel, outer buoy is, outside the bar, in 16 feet water at low tide. This buoy is a second class iron can-buoy, painted red, with the number 2 in white, and must be left on the starboard hand in entering inner point of St. Catherine's, bearing S. W. by W. ½ W.; inner point of Ossabaw, W. by S. ½ S.; inner buoy, S. W. by W. The inner buoy is placed on the outer edge of a shoal running off from Ossabaw island, in 10 feet water at low tide; is a third class iron can-buoy, painted red, with the number 4 in white, and must be left on the starboard hand in entering, inner point of St. Catherine's, bearing S. W. by W.; inner point of Ossabaw, W. by S.; outer buoy, N. E. by E.; distant 2½ miles.

Note.—In running in for this bar, when in four fathoms water, bring the north point of St. Catharine's to bear W. S. W., and stand in W. by S., until you make the outer buoy; when up with it, steer for the north point of St. Catharine's, S. W. by W. ½ W., leaving the inner buoy on the starboard hand. The water is bold near the beach.

At the Swash channel, Bull-tongue bank, St. Catharine's Sound, the north buoy is a conical iron buoy, painted red, is placed in 10 feet water at low tide, and must be left on the starboard hand going south; south end of Ossabaw bears E. N. E. north, and of St. Catharine's S. E. by S.

Southern buoy is a third class nun buoy, painted red, with white flag on the staff, is placed in 15 feet water at low tide, and must be left on the starboard hand going south; St. Catharine's point of Waldburg's Creek S. by W., northern buoy N. by E.

Note.—The northern and southern buoys are about one mile apart, course from one to the other N. by E. and S. by W.

Quarantine Laws of Venezuela.—The following translation of a circular from the Jefe Politico (Mayor) of La Guayra, relating to the quarantine laws of Venezuela has been received at the Department of State, from J. T. Golding, Esq., United States Consul at tnat port. This circular was issued on the 7th January, 1856:

"The Board of Health of this port, in its session of the 2d inst., took into consideration the different manners of certifying the bills of health issued at foreign ports, and the general practice heing at variance with the provisions of the first article of the Executive decree of the 11th of August, 1847, relating to the matter, resolved that for the future, bills would only be considered clean when coming legalized by the authorities to which this branch belongs, whose signatures must then be certified to by the respective Consuls, granting a period of one month after which this decision shall take effect—passing an official notice to the foreign Consuls in this port, to whom it may be considered requisite to inform of this decision, and also to the Governor of the province."

It appears that the shipmasters, in some ports of the United States, are in the habit of obtaining bills of health simply from the Venezuela Consul, which will not be received by the authorities at Venezuela ports after the 7th of February, 1856. The law to which the circular relates (11th August, 1847,) says "that the bills of health shall be granted by some competent authorities of the place, and must be legalized by a Venezuelan Consul, if there is one at the port from which the vessel may sail; if not, by a Consul of any other nation on terms of amity with Venezuela, which bill of health must be certified to, or legalized, by the Venezuelan Consul, or some other Consul at each and every port the vessel may touch at before her arrival at a Venezuelan port."

Light on the Great Isaacs, Bahama Banks.—A notice was published in the *Coast Pilot*, based on information received from Nassau, New Providence, that the light-house on the Great Isaacs would be built in August, 1855, and lighted in January, 1856. I regret to state that it is not so. The tower, which is of iron, has been completed in London, and is probably now on its way to its destined site, and it is hoped will be ready during the next summer. Would it not be advisable to have this light-house known among American navigators as the Lawrence Light, as its erection was caused through exertions of the lamented Abbott Lawrence, while Minister to the Court of St. James. Geo. W. Blunt.

Information has been received at the Office of the Light-house Board, that the light vessel stationed in Hooper's Straits, entrance to Tangier Sound, Md., has been driven from her station by ice. Notice of her return will be given.

Norfolk, Va., Feb. 21, 1856.

A second class can buoy, with "G. Fawn" on the head, and numbered 2 on three sides, has been placed off the end of Great Fawn Bar.

A spar buoy, with black and red horizontal stripes, has been placed near Barrel Rock.

A second class black nun buoy has been placed off Harding's Ledge, in lieu of the bell-boat, which will be replaced when repaired.

Boston, Feb. 28, 1856.

LIVERPOOL, Feb. 28, 1856.

FOG GUNS AT SOUTH STACK LIGHT-HOUSE.—The following letter has been received from the Board of Trade, by the Steamship Association of this port, in reference to a communication from that body, in reference to fog guns at South Stack light-house:

OFFICE OF THE PRIVY COUNCIL OF TRADE,
MARINE DEPARTMENT, WHITEHALL, Feb., 27, 1856.

SIR:—I am directed by the Lords of the Committee of Privy Council of Trade to acknowledge the receipt of your letter of the 12th ult., relative to the necessity of placing fog guns at the South Stack light-house.

My Lords desire me to acquaint you, for the information of the Liverpool Steamship Association, that they have decided upon placing two twenty-four pound guns, to be fired in quick succession every half hour during foggy weather, and due notice will be given of their being ready for use.

I am sir, your obedient servant,
J. D. TENNENT.

BENJAMIN J. THOMPSON, Esq.,
Secretary Liverpool Steamship Association.

THE BOSTON HARBOR TELEGRAPH CONNECTS WITH THE CAPE COD MARINE TELEGRAPH.—Vessels approaching the stations at Highland Light, Provincetown, Chatham, Hyannis, and Hull, will please show their designating Nos. on Marryatts flags, in order that their arrival may be reported to their owners, and to the Merchants' Exchange News Room.

Vessels in distress, in sight of the stations, can have immediate relief by signalizing their wants.

JOHN T. SMITH,
Merchants' Exchange News Room.

Boston, March 2, 1856.

NOTICE is hereby given that the "Bishop & Clerks" light-vessels, Vineyard Sound, is this day remoored upon her station.

Boston, Feb. 29, 1856.

NEW-YORK HARBOR LIGHTS.—Mr. George W. Blunt says: "If one is obliged to run in without a pilot, he can do so with perfect safety, in the day time, in following the directions.

"Six structures to contain lights as ranges for the channels, have been erected in New-York harbor. The lights will be lighted during the present year.

"1st. Gedney's Channel Lights are two in number: the front one, on Raritan Bay, Jersey shore, is on the keeper's house, in a turret. The focal plane of the light is 40 feet above high water. The rear light is in a tower 76 feet above high water. These lights in range will carry 19 feet at low water over the bar, and clear everything until inside of Sandy hook.

"2d. Swash Channel Lights, two in number, are on Staten Island. The front one is in a tower; the focal plane of the light is 59 feet above high water. The rear light is on the keeper's house in a turret, 189 feet above high water. These in range, when outside of the bar, will cross the bar in 23 feet water, and lead through the Swash Channel up to the red buoy of the Upper Middle.

"3d. Main Ship Channel Lights, two in number, to be used after turning the S. W. spit buoy. The front light is in a tower; the focal plane of the light is 60 feet above high water mark. The rear light is on the keeper's house, in a turret; the focal plane of the light is 224 feet above high water. After turning the S. W. spit, by keeping these in range, you run in mid channel, until Robbin's Reef light is open with the light at the Narrows; keeping these open clears the West Bank.

"They will all be fixed lights."

THE Bartlett's Reef light-vessel, Long Island Sound, and Eel Grass Shoal light-vessel, Fisher's Island Sound, N. Y., have been remoored at their stations, and will exhibit their lights and answer signals in foggy weather as heretofore.

The iron can-buoys, marking Black Ledge and Mercer's Rock, at the entrance to New-London harbor, Conn., have also been replaced.

New-York, March 3, 1856.

THE iron can-buoy having been carried away from "Ohio Ledge," by the ice; its place is temporarily supplied by a twenty feet spar-buoy, with perpendicular red and black stripes, placed in 8 feet water at low tide

The iron can-buoy on the south point of Goat Island, in Newport harbor, has been replaced.

Custom-House, Newport, Feb. 25, 1856.

NOTICE TO MASTERS OF VESSELS ARRIVING AT THE PORT OF MOBILE.—[Section 864 of the Cod, of Alabama.]—Every master of any vessel arriving from any port or place, out of this State, (except New-Orleans,) at the port of Mobile, who is, by any law of the United States, required to

enter such arrival at the Custom-House, must, within one day after such arrival, deliver at the Mayor's office on oath, a correct list of every person who arrived in such vessel, first stating the names of the officers and crew; the names of each passenger; the color and sex of each person; and if they are free or slaves.

Mobile, March 7, 1856.

Light for Salamis Roads and Port Peiræus, Athens, Greece.—Official information has been received at the Office of the Light-house Board, through the Department of State, that the Minister of the Interior Department of the Kingdom of Greece has given notice that a sixth order light will be exhibited on and after the 13th instant, (March, 1856,) from the tower recently erected on the Islet of Psitalie, at the distance of two miles to the westward of the entrance to the Peiræus.

This light will serve for the roads of Salamis, and for entering Port Peiræus.

The small temporary light exhibited near the tomb of Themistocles, will be discontinued at the same time.

Washington, March 26, 1855.

Ocklockonee Shoal, (Florida,) Bell-boat.—A bell-boat has been placed at the Ocklockonee Shoal, Fla., in $3\frac{1}{4}$ fathoms water, the shoal bearing from it W. N. W. $1\frac{1}{4}$ mile distant.

The light-house at the mouth of St. Mark's river bears from the boat N. $\frac{1}{2}$ W. (magnetic) 17 miles distant; the S. W. cape W. $\frac{1}{4}$ N. 10 miles, and the seaward point of "south shoal" S. W. $\frac{1}{2}$ S. 10 miles distant. On the bearing of the St. Mark's light-house, the depth of water is 3 fathoms or more. To carry that depth clear of the south shoal westerly, it will be well to run from the boat S. W. by S. southerly.

The boat is black, and can be seen, in clear weather, at a distance of 8 miles. The bell is sounded by the action of the waves.

Mobile, Ala., Feb. 26, 1856.

SALES OF VESSELS.

Schr. Lamartine, built at Belleville, N. J., 7 years old, 180 tons, at auction for $4,350, cash.
Schr. Anna Jenkins, of Providence, built at Long Island, for $6,500, cash.
Barque Joseph Fish, built at Thomaston, 8 years old, 276 tons, for $8,000.
Schr. Ella Simmons, built at N. Carolina, 1851, at auction for $700.
Barque Eutaw, at Boston, 200 tons, for $8,500.
Schr. California, at New-Bedford, at auction, March 8, for $125.
Ship Oxnard, built at Medford, 12 years old, 595 tons, for $19,000, cash.
Barque Lyman, 300 tons, for about $14,000.
Ship Isaiah Crowell, at Boston, 522 tons, for $22,000.
Schr. Life Boat, 3 years old, 130 tons, for $4,500, cash.
Ship Indus, 900 tons, for $55,000, built at Newburyport.
Ship North Wind, built at New-York, 1 year old, 1,040 tons, for $60,000.
Barque Mazeppa, built at Stonington, 15 years old, 290 tons, for $5,500.
Brig China, built at Dartmouth, Mass., 1848, 196 tons, February 21, at auction for $6,600, cash.
Brig Reveille, 183 tons, 9 years old, for $4,200.
Barque America, built at Connecticut, 10 years old, 367 tons, for $6,250.
Barque Terror, of Boston, 406 tons, 3 years old, for £3,400.
Barque Lecocq, built at Robinstown, Me., 267 tons, $5\frac{1}{2}$ years old, for $9,000.
Schr. Indicator, built at Marblehead, 3 years old, 176 tons, for $9,000.
Schr. Walker, 83 tons, formerly U. S. Revenue Cutter, at auction for $1,450, cash.
By J. R. Dow, steamer Tennessee, 1,200 tons, 1 year old, built in Baltimore, for $72,500.
By Rounds, Hudson & Ranney, of Buffalo, schooner Traveller, for $7,500.
" " " " Mary, for $6,000.
" " " " Argo, for $6,000.
Brig Courtlandt, for $6,000.
By C. H. Bell, of Milwaukie, schooner Robt. Campbell, for $6,500.
By R. K. Winslow, of Cleveland " Wm. Case, for $15,000.
" " " J. H. Drake, for $14,500.
" " 5-12 of " Phalanope, for $5,900.

ICONOGRAPHIC CATALOGUE OF THE U. S. NAVAL LYCEUM, AT THE NAVY-YARD, BROOKLYN, N. Y.

NATURAL HISTORY.

Part II.

SECTION I.—MINERALOGY.—*Concluded.*

2. ANHYDROUS SILICATES OF MAGNESIA, AND SIMILAR COMPOUNDS.

PYROXENE.—Consisting of Silica and Magnesia combined, with one or more of the bases, lime, protoxide of iron, or protoxide of manganese. The variety of this mineral may be divided into three sections.

1. *White Angite.*—Including all the light-colored Pyroxenes, as *Diopside,** *Sahlite,** so called from its original locality, Sahla; *Coccolite,** a general name for all the granular varieties derived from the Greek *κοκκος*, a grain. *Asbestus*, including all the fibrous varieties.

2. *Augite.*—Black and greenish—*i. e.*, black specimens; comprising *Augite* proper*, *Hedenbergite*, *Hudsonite*, and *Jeffersonite.**

3. *Diallage.*—Thin foliated varieties—*Bronzite,** *Hypersthene*, *Labrador Hornblende.* The species Pyroxene is one of the most common minerals It is found abundantly in New-York State; the white crystals are abundant in the quarries near Sing Sing. Did it ever occur to our readers, what an excellent opportunity our State convicts have for studying mineralogy? Breaking stones per force, however, is a very different thing from breaking them for the love of it.

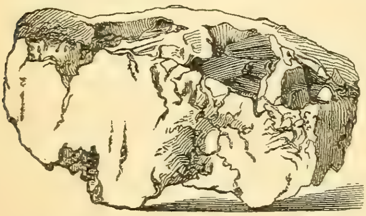


Fig. 22.

Figure 22. The annexed cut is taken from a specimen in the Lyceum collection, and shows the usual grouping of the crystals in a striking manner. The crystals are of *the white variety mentioned above.*

HORNBLENDE.—The composition of this mineral is very similar to the preceding. Varieties are: *Tremolite,** *Actinolite,** *Asbestus,** *Pargasite,** *Hornblende proper.**

This mineral is an important constituent of the rocks syenite, trap, and hornblende slate. It is abundant in New-York State, especially in Orange Co. Asbestus is the only variety of this mineral used in the arts. It derives its name from its property of resisting the action of fire. Patents have been taken out for cloth manufactured from it. It is extensively used for lining iron safes.

Other minerals of this class are: *Chrysolite*,* *Chondrodite*,* *Acmite*, *Boltonite*,* *etc.*

ALUMINA. 1. *Sapphire.*—Composition, pure alumina. The term Sapphire is sometimes restricted to the clear varieties used as gems, while less brilliant varieties are known as *Corundum*,* or *Emery.** Blue is the true Sapphire color; when of other bright tints it receives other names, as *Oriental Ruby*, when red; *Oriental Topaz*, when yellow. The varieties of the Sapphire which are met with in the United States are seldom fine enough for gems. Ceylon is the principal locality of the blue. The largest oriental ruby known was brought from China to Prince Gargarin, Governor of Siberia, and now constitutes a jewel in the imperial crown of Russia.

2. *Spinel.**—Composition, alumina, 75.5; magnesia, 17.9; per-oxide of iron, and silica, in variable proportions. Found abundantly at Sparta, and neighboring places in New-Jersey.

3. *Zeolite Family.*—So named, because the species generally melt and intumesce before the blowpipe, the term being derived from the Greek ζετα, to boil. They consist essentially of silica, alumina, and some alkali, with more or less water. Most of them form a jelly in acids, owing to the separation of the silica. They are abundant in Nova Scotia. The principal varieties are: *Heulandite, Stilbite*,* *Apophyllite*,* *Laumonite*,* *Natrolite*,* *Mesotype*,* *Thomsonite*,* *Harmotome*, *Analcime*,* and *Chabazite.**

Prehnite.—Composition, silica, 43.0; alumina, 23.25; lime, 26.0; protoxides of iron and manganese, 2.25; water, 4.0. Of a light green color, and fine botryoidal structure. Prehnite receives a handsome polish, and is sometimes used for inlaid work. In China it is polished for ornamental purposes.

*Kyanite** and *Sillimanite** are allied minerals. Composition, silica, 37.0; alumina, 62.5. Kyanite takes its name from its color. Sillimanite, named in honor of Prof. B. Silliman.

Andalusite,* *Staurotide*,* and *Leucite** are all silicates of alumina, containing more or less protoxide of iron or manganese.

*Felspar.**—Composition, silica, 64.20; alumina, 18.40; potash, 16.95. A very abundant mineral, one of the constituents of granite. Its principal varieties are: *Glassy Felspar*,* *Moonstone*, *Sunstone*, and *Fetid Felspar*, the names of which explain themselves. Felspar is used extensively in the manufacture of Porcelain. It is also employed in the manufacture of artificial teeth. Of course, the variety known as fetid spar would not answer for the latter purpose, as it emits a most disagreeable smell upon the slightest friction.

Albite,* *Labradorite*, *Nepheline*, *Elæolite*, *Scapolite*,* and *Spodumene*, are allied minerals.

*Epidote.**—Composition, silica, 37.0; alumina, 26.6; lime, protoxide of iron, protoxide of manganese, and water, in varied proportions This min-

eral is of a beautiful yellowish green color, and is well represented in the Lyceum collection by a fine specimen from Norway. Found beautifully crystallized at Haddam, Ct.

*Idocrase.**—Composition, silica, 37.4; alumina, 23.5.

*Garnet.**—Composition variable; silicates of alumina, lime, iron, or manganese. The clear varieties of this mineral are somewhat rare, and are used in jewelry. Coarser specimens are very abundant. In the United States precious garnets of small size are found at Hanover, N. H. The best come from Pegu; they can be cut quite thin on account of their depth of color. An octagonal garnet, measuring 8½ lines by 6½, has sold for near $700. Pliny describes vessels of the capacity of a pint, formed from large carbuncles, "devoid of lustre and transparency, and of a dingy color," which probably were large garnets.

*Tourmaline.**—Composition, silica, 33.0; alumina, 44.0; protoxide of iron, 23.8; soda, 3.2; boracic acid, 1.9. The presence of boracic acid is the most remarkable point in the constitution of this mineral. The principal varieties are: *Black* Tourmaline*, the most common, *Brown,* Red,* Green.** Highly colored specimens are found at Paris, Me., and elsewhere in the United States.

Acmite and *Iolite* are allied minerals.

*Mica,** vulgarly known as "isinglass."—Composition, silica, 46.3; alumina, 36.8; potash, 9.2. This mineral is so well known as hardly to need description. It is one of the constituents of granite. On account of its toughness, transparency, and the thinness of its folio, it has been used in Siberia as glass; whence its name, "*Muscovy glass.*" It was formerly employed in the Russian navy, because not liable to fracture from concussion. The best localities in the United States are those of New-Hampshire.

Topaz.—Composition, silica, 34.2; alumina, 57.5; fluoric acid, 7.8. Topaz is employed in jewelry, and for this purpose its color is often altered by heat. The variety from Brazil assumes a pink or red hue, so nearly resembling the ruby that it can only be distinguished by the facility with which it becomes electric by friction. Trumbull, Conn., is the best locality of this species in the United States.

Fig. 23.

5. GLUCINA.—*Beryl*—Emerald.*—(Fig. 23.)—Composition, silica, 66.5; alumina, 16.8; glucina, 15.5; oxyde of iron, 0.6. The annexed cut represents a specimen in the Lyceum collection. It was selected as illustrating the manner in which the crystals penetrate and cross each other. The finest emeralds come from Grenada. A crystal from this locality, two inches long, and an inch in diameter, is in the cabinent of the Duke of Devonshire, and is valued at 150 guineas. Emeralds of less beauty, but

of gigantic size, occur in Siberia. One in the Royal collection of Russia measures $4\frac{1}{2}$ in. by 12 in., and weighs $26\frac{3}{4}$ lbs. troy. In the United States, *beryls* of enormous size have been found, but seldom transparent crystals—emeralds. One from Ackworth, N. H., weighed 240 lbs., and measured 4 feet in length.

Euclase, *Chrysoberyl*, *Phenacite*, are similar minerals.

6. Zirconia.—*Zircon.**—Composition, silica, 33.5 ; zirconia, 67.2. The clear crystals (hyacinths) are of common use in jewelry. When heated in a crucible with lime, they lose their color, and resemble diamonds, for which they are substituted. Siberia furnishes crystals as large as walnuts. In the United States, fine crystals of zircon are found in Buncombe Co., N. C.

7. Thoria.—The earth, thoria, has been found only in a rare mineral named from its constituent *thorite*, and in the ores *monazite* and *pyroclore*.

CLASS VII.—METALS AND METALLIC ORES.

1, 2. Cerium Yttrium are not used in the arts, and are so rare as hardly to deserve mention in a sketch like the present. *Monazite* is classified here.

3. Uranium.—*Pitchblende.*—Composition, oxide of uranium. Occurs in the United States, at Middletown and Haddam, Conn.

*Uranite.**—Composition, phosphoric acid, .15 ; oxide of uranium, .64 ; lime, .6 ; water, .15. Found at Middletown, Conn., and Chesterfield, Mass.

4. Iron.—The metal, iron, has been known from the most remote historical period ; but was little used until the last centuries before the Christian era. Bronze, an alloy of copper and tin, was the almost univeral substitute. The *Chalybes*, bordering on the Black Sea, were workers in iron and steel, at an early period; and from this source we have the expression "*chalybeate*" applied to certain substances or waters containing iron. The ores from which the iron of commerce is obtained are, the *spathic** (or *carbonate*), *magnetic iron*,* *specular** (or *peroxide*), *brown ore** (or *hematite*), and *bog ore*.

*Spathic Iron.**—Composition, protoxide of iron, 61.37 ; carbonic acid, 38.63. A vein of considerable extent occurs at Roxbury, near New Milford, Conn. ; at Plymouth, Vt., at Sterling, Mass., it is also abundant.

*Magnetic Iron.**—Composition, peroxide of iron, .69 ; protoxide, .31. Masses of this ore in a state of magnetic polarity, constitute what are called native magnets, or lodestones. The lodestone is called *magnes*, by Pliny, from Magnesia, a province of Lydia, where it was first found. No ore of iron is more generally diffused than the magnetic, and none is more useful for the manufacture of iron.

*Specular** *Iron*—Peroxide of Iron.—Composition, oxygen, 30.66 ; iron, 69.34. Splendid crystallizations of this ore come from Elba, whose beds

were known to the Romans. This mineral is well represented in the Lyceum.

*Brown Iron Ore.**—Composition, peroxide of iron, 85.3 ; water, 14.7. This is an abundant ore in the United States. Extensive beds exist in Salisbury and Kent, Conn. *Bog Ore** is a loose, earthy ore, of a reddish or brownish-black color, occurring in low grounds.

Other less useful ores of iron are as follow:—*Iron Pyrites**—sulphuret of iron—useful only for its sulphur; *Ilmenite*,* of no value in the arts; *Chromic Iron*,* used in the preparation of chrome colors; *Columbite*,* highly valued by mineralogists, but too rare to be useful; *Wolfram, copperas,* much used in the arts, but generally procured artificially.

5. Manganese.—Manganese is never used in the arts in a pure state; but as an oxide it is largely employed in bleaching. It is also employed to give a violet color to glass. The sulphate and chloride are used in calico printing. Its principal ores are:

*Manganese Spar.**—Composition, oxide of manganese, 52.6; silica, 39.6; oxide of iron, 4.6; lime and magnesia, 1.5; water, 2.7. Found at Plainfield and Cumington, Mass.

Pyrolusite.—Binoxide of manganese—valuable for its oxygen, which it readily parts with.

*Wad.**—Peroxides of manganese and of iron, in varying proportions. Sometimes used for umber paint.

6. Cromium.—Never found native. Its principal ores are the chromates of lead and iron.

7. Nickel.—The Nickel of commerce is mostly obtained from the copper nickel; its ores are nowhere very abundant, the most productive are those of Saxony and Germany. The metal is used for various purposes, on account of its freedom from rust. Also in the preparation of German Silver.

8. Cobalt.—Never found native. The two arsenical ores, *Smaltine* and *Cobalt Bloom*, afford the greater part of the cobalt of commerce. The metal is of no use in the arts on account of its brittleness. Its oxides are used for painting porcelain and pottery.

9. Zinc.—Zinc occurs in combination with Sulphur, Oxygen, Silica, Carbonic and Sulphuric Acids. The most important ores are:

*Blende**—*Sulphuret of Zinc.*—Composition, zinc, 66·72; sulphur, 33·28 The lead mines of Missouri and Wisconsin afford this ore abundantly. It is the Black Jack of the miners. It is a useful ore of zinc, though more difficult of reduction than calamine.

*Red Oxide of Zinc.**—Composition, oxide of zinc, 93.5; protoxide of manganese, 5·5. Found abundantly at Franklin, N. J. A good ore of zinc, when abundant, and easily reduced.

*Calamine.**—*Carbonate of Zinc.*—An important ore.

*Electric Calamine**—Composition, silica, 26·2; oxide of zinc, 66·4; water 7·4. Occurs with calamine in the United States, at Perkiomen, Pa., and elsewhere.

10.—CADIUM.—There is but a single ore of this metal. A sulphuret known as *Greenockite*, found at Bishopton, Scotland.

11. BISMUTH.—Bismuth occurs native, and also in combination with sulphur, tellurium, oxygen, carbonic acid and silica, most commonly, however, uncombined. It is abundant with the ores of silver, in Saxony and Bohemia, also, in Monroe, Conn. This metal is employed in the manufacture of the best type metal, and for many other purposes.

12. LEAD.—This important metal rarely occurs native. Its principal ores are as follows:

*Galena.**—Composition, lead, 86·55; sulphur, 13·45. The lead region of Wisconsin, according to Mr. D. D. Owen, comprises 62 townships in Wisconsin, 8 in Iowa, and 10 in Illinois, being 87 miles from East to West, and 54 miles from North to South. The ore is inexhaustible. The lead of commerce is obtained from this ore.

Minium.—Oxide of Lead. This is the red lead of commerce; but for the arts it is artificially prepared. *Anglesite—Sulphate of Lead.*

White Lead ore. Oxide of lead, 83·64; carbonic acid, 16·54; when abundant, this ore is wrought for lead.

*Pyromorphite**—*Phosphate of Lead,* and *Chromate of Lead,* are other useful ores of lead.

13. MERCURY.—Mercury occurs native in fluid globules. In this state it is rare, yet it is met with at the different mines of this metal. Its principal ore is,

*Cinnabar**—*Sulphurate of Mercury,* found chiefly at Idria in Austria; (from which mines there are some fine specimens in the collection); Almeda, in Spain, and Huanca Vatica in Peru. A large mine has been discovered also in Upper California. The Chinese have mines of Cinnabar in Shensi.

14. COPPER.—Copper occurs native in considerable quantities, as at Lake Superior. It often contains silver. Its principal ores are:

Fig. 24.

COPPER PYRITES*—*Fig.* 24.—The annexed cut represents a nodule of this mineral cut through the centre, and displaying the beautifully radiated structure of the interior. Copper Pyrites strongly resembles native gold, and has been the source of innumerable blunders on this account. It can, however, be easily distinguished by its brittleness, gold being readily cut with a knife. This ore, besides being mined for the copper, is extensively employed in the manufacture of blue vitriol. Its composition is,

sulphur, 36·3 ; copper, 32·1 ; iron, 31·5. It is so abundant as hardly to need further description.

Gray Copper Ore.—Composition, sulphur, 26·3 ; copper, 38·6 ; antimony, 16·5 ; arsenic, 7·2.

Red Copper Ore.—Copper, 88·88 ; oxygen, 11·12.

*Blue Vitriol**.—Sulphuric acid, 31·7 ; oxide of copper, 32·1 ; water, 36·2. There are some beautiful stalactites of this mineral in the collection, from the Cuban mines.

*Green Malachite.**—Composition, carbonic acid, 18 ; oxide of copper, 70·5 ; water, 11·5. Of this species we have some remarkably fine specimens, presented, together with several other ores, by the Royal Society of St. Petersburgh. This beautiful ore is found abundantly in Siberia; at Nischne Fagilsk, a block was obtained weighing 40 tons. Our ariscrocratic English friends, who were congratulating themselves upon the speedy decoration of their palaces with the Malachite slabs, for which St. Petersburgh royalty is famous, will doubtless be disappointed by the peace prospects; perhaps that is what makes them so bellicose just at present.

*Azurite** and *Chrysocola** are other unimportant ores.

15. Titanium.—*Rutile*,* oxide of titanium, and *Sphene*, titanate of silica, are the principal ores of this metal. It is not used in the arts.

16. Tin.—*Native tin* is found in gray metallic grains, in the gold washings of the Ural Mountains. Its principal ore is

Oxide of Tin, found chiefly at Cornwall, England.

17.—Molybdenum.—Sulphuret of Molybdenum—Molybdenum, 59.8 ; sulphur, 40.2. Found in New-York State at Warwick, and also in many other parts of the United States.

18.—Tungsten.

19, 20.—Vanadium.* Tellurium are rare metals.

21.—Antimony.—*Native Antimony* is found in silver and other ores.

Gray Antimony—Antimony, 73 ; sulphur, 27. Found at Schemnitz (Hungary), sparingly at Carmel (Me.), and Lyme (N. H.) This ore affords nearly all the antimony of commerce.

White Antimony and *Red Antimony* are other ores.

22. Arsenic.—The ores of arsenic are: *white arsenic*, the well-known poison ; *orpiment* and *realgar*, the yellow and red sulphurets.

NOBLE METALS.

1. Platinum.* Iridium.* Palladium.—*Platinum* is found in flattened or angular grains or irregular masses. Its infusibility and resistance to most chemical agents render it of great value in the construction of chemical and philosophical apparatus. It is coined in Russia, but is not a legal tender.

Iridium is extremely hard, and is used for nibs to gold pens.

Palladium, a somewhat rare metal, which occurs in Brazil, associated with gold.

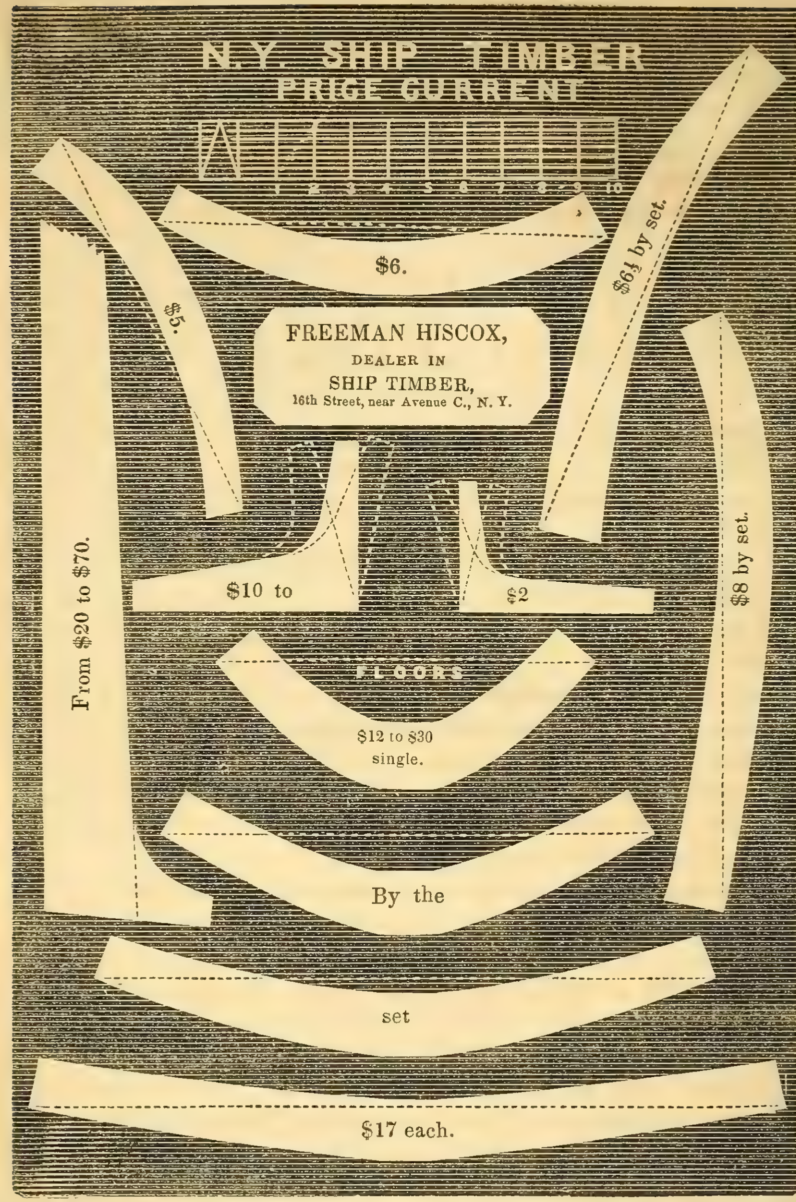
2. GOLD.—*Gold** occurs mostly native, being either pure or alloyed with silver and other metals. Gold is widely distributed over the globe, at least so say all works on mineralogy, although the author of this sketch has reason to doubt the assertion from his own experience. It occurs in Brazil, California, New Grenada, North Carolina, Virginia and Georgia, and elsewhere on the Western Continent; and in Hungary, the Urals, Altai Mountains, and in the Cailas Mountains of Little Thibet. Besides these principal localities, it is found in the sands of a vast number of rivers, many of which are worked and are quite profitable. The Rhine has been the most productive of the European rivers; but at present only $9,000 are extracted annually. The sands of the richest quality contain only about 56 parts in a hundred million. Sands containing half this proportion are profitably worked. It was supposed at one time, (and it is doubtful whether the idea is wholly given up at present), that the sands of Long Island were particularly rich in the precious ore, with the additional advantage of its being ready coined; and many, forgetting that a "bird in the hand is worth two in the bush," have spent the gold already possessed by them, in the hope of robbing Captain Kidd's ghost.

The standard gold of the United States consists of 900 parts of gold to 100 of an alloy of copper and silver.

3. SILVER.—*Native silver** is usually an alloy of silver and copper. It occurs in masses and arborescences penetrating rocks. Found in Norway, (at Kongsberg), Peru, and Mexico, and at Lake Superior. It has also been observed near Sing Sing Prison, another opportunity for our convicts.

Vitreous Silver.—Sulphuret of silver. *Brittle Silver.*—Sulphuret of silver and antimony are important ores.

Horn Silver—Chloride*—is the ore of the South American mines.



A set of floors and futtocks, $9 each. Oak Flitch, 30 cents per cubic foot ; oak plank, $36⅔ to $40 per M : deck plank, $35 per M. ; hackmatack timber, 25 cents per cubic foot ; chestnut, ditto ; cedar, 30 to 50 cents ; yellow pine timber, rough, 35 to 45 cents per cubit foot ; ditto, sawed, $28 to $30 ; yellow pine plank, $28 to $30 per M.

OAK KNEES—5 inch $2 50 ; 6 inches, $5 ; 7 inches, $7½ ; 8 inches, $10 ; 9 inches, $12 ; 10 inches, $15 ; above, $1 50 per inch.

HACKMATACK KNEES—5 inches, $1.50 ; 6 inches, $2 50 ; 7 inches, $4 25 ; 8 inches, $6 00 ; 9 inches, $7 ; 10 inches, $9 00 ; above, $1 per inch.

Yellow metal, 25 cents, at 6 months ; copper sheet, 28½ cents, ditto ; copper bolts, 31 cents, ditto ; composition nails, 19 cents, ditto.

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IRON SEA-GOING VESSELS LESS RELIABLE THAN WOOD.

At this time when so much is being said about "safety at sea," we regard it as not less our privilege than our duty, to contribute what knowledge we may possess, both upon the material of construction and its mode of distribution in sea-going vessels, and more particularly in those designed for the conveyance of passengers, propelled by steam. We have no hesitation in giving our reasons for preferring wood to iron, for the shell of all seaward vessels, nor can we discover any reasonble grounds for concluding that England would not still do the same, were it not for the fact that her *forests are gone*, while her iron mines are yet prolific; hence we may discover the reason why iron vessels are regarded as being better than wood, *because iron is the cheaper*. Important discovery! How fortunate the people of England were in making it, just at the time when the oaks of England, like the aborigines of America, were figuring more largely on the page of history than elsewhere. We are hardly persuaded that there is a single nautical mechanic who, having no other interest to serve than philanthropy, and having a good degree of experience both in wood and iron as a material of construction for the hulls of vessels, has not had misgivings in reference to an iron shell. It will not be assumed by us that there are not exceptions even to this rule, as a measure of utility; there are circumstances in which iron is the best, and in which we ourselves have both recommended and used it. But let us examine those conditions. The navigation was a shallow stream of fresh water, from one to three feet in depth. The iron shell being scarcely more than one fourth of the thickness of wooden hulls of vessels of equal tonnage, it may well be supposed that while the laws of flotation were ope-

rative and the water was kept out of the hold, the iron hull would be the lightest; and inasmuch as human life could hardly be jeopardized by foundering, it is not difficult to imagine that the iron vessel, although costing from 25 to 30 per cent. more than the wooden one (in the United States), would be adopted of necessity. Such vessels have been, and will continue to be built, both in this country and in England. The Magdalena, Oronoco, Sacramento, and other rivers, are of the class requiring such description of vessels. But for sea-going purposes the case is quite different; the tortive influences of the waves upon the hull, render bulk-heads a necessary measure of safety to the vessel, without which they would founder beyond remedy. The lap of the iron sheets at the rivet hole, operate like shears to clip off the rivets; and should the diameter of the rivets be increased to prevent this, the sheets would become too much weakened at the edge to resist the strain, when a rupture would admonish the confiding tenants, that iron vessels, *although lighter than wood by the scales of displacement, are indeed much more weighty* when filled with water, by all the difference in the specific gravity of the two kinds of material; hence the reason why iron vessels are never found at sea with their holds full of water. Iron never floats; wooden vessels have often been seen water logged at sea, and have been brought into port. It is a truth which has some significance, that in the time of the greatest danger from foundering, wooden vessels are found to be the lightest, and must continue to be so, as long as wood floats and iron sinks; or, as long as water furnishes the scales by which wood and iron vessels are to be weighed. If it were a truck, omnibus, or land conveyance, the case would be different. Where the force of gravity is not intercepted, an iron carriage might be made to weigh less than a wooden one, the strength in each being equal; but where buoyancy tenders its services, wood always has the preference over iron, unless the specific gravity of the material is above that of iron. If two vessels of equal capacity were weighed, the one being built of wood, the other of iron, the latter might be set down at 1000 tons weight, while the wooden vessel would perhaps weigh 1400 tons; but let those vessels be filled with water, and we find that the wooden vessel floats while the iron vessel sinks; and this would hold good if the wooden vessel weighed five times as much as the iron vessel, provided the specific gravity of the wood and fastenings were less than that of water. But we not only find that the wooden vessel floats when filled with water, but that she is able to carry some cargo. All the buoyancy there is in the iron vessel, is found in the cavity between her sides and bottom; while the immersed part of the wooden vessel carries its own weight, which will make up for the difference in the thickness between wood and iron vessels. But we have been told that the construction of wooden vessels is not as well known as that of iron; or that the construction of wooden vessels has not been brought to so great a state of perfection. This is a great mistake; there is scarce a limit to the variety in the modes of

building wooden vessels, while the cost would not materially differ. Not so in the construction of vessels of iron—the variety is indeed limited, partly on account of the cost; for it must not be forgotten that it is much more costly to experiment in iron than in wood, and every new model or mode of construction is an experiment; hence one of the reasons why there is so little variety either in the model or arrangement in iron vessels; and we may add, that the improvement in the model is equally small—they seem to be made like shoes upon a last, expanded or contracted according to the size required, with but little reference to utility or improvement in their form; and we should incline to the belief that there is no more known of iron than of wooden maritime construction in England, and much less we know in the United States. There is, indeed, as much if not more known of the proper proportions for the different parts of wooden, than is shown in the construction of iron vessels, if we may judge of those that enter our own ports. So difficult has this been found, and the desire to cheapen vessels so great, that it has been determined to use cast iron for some of the more difficult parts of iron construction. The Great Britain has been cited as an evidence of the advantages of iron over wood in securing strength, but fails to be conclusive to our minds. That iron will bear more chafing upon the rocks with less wear, no one will deny, and has also more attraction for the magnet, as our transatlantic friends well know; but, aside from that, we can cite a number of instances in which wooden vessels have been on the beach during a gale with a heavy cargo, and again taken their place in the line of packets.

If wooden vessels had the proportionate admixture of materials in their construction, with the iron keelson to enable them to maintain their longitudinal equilibrium of form, they will compare favorably with iron vessels in every aspect in which the subject may be viewed, except that of fire; and inasmuch as bulkheads are necessary in iron vessels to prevent torsion—whi e the wooden vessels would bear it under ordinary circumstances without perceptible inconvenience, what objection can there be to putting iron bulkheads and iron keelsons in wooden vessels, to render them substantially life-boats, by dividing them into compartments? Much has been said about the compartment principle being old; we say yes, it is old in iron vessels, and so of necessity, and although new in wooden vessels, it is not the less advantageous both for the security of life and property.

Of the durability of iron vessels we may only say, that if wooden vessels received a greater amount of care, they would last as long as iron. There is very little attention paid to wooden vessels, compared with what there should be; in ventilation they are sadly deficient. If, when our forests are gone, it should be found necessary to go into iron ship building in this country, we should not be content to commence where England now is, but to obtain an American *cast* or model, that we may have an improved one. We have squandered our timber advantages, let us be more careful and not convert ship tim-

ber into log heaps to be burned, or into heading and staves, to waste three quarters of the tree; it would be better to make casks of iron, and ships of wood, as far as the safety of human life is involved. Although we are not of the number of those who would not, under any circumstances, cross the Atlantic on a winter passage in an iron vessel, we would, however, prefer the wood, not only because it floats while iron sinks, but because a leak can be more readily stopped. Iron screw vessels have furnished the most unmistakable evidence of their insufficiency in the material under the present *regime* of construction, consequent upon the many instances in which serious leaks have been found, and the impossibility of adding security at the posterior extremity. In wooden vessels, the body of the material surrounding the shaft and its bearing, has furnished additional security; and at the same time the friends of iron vessels have a reason to give—why some of the iron builders make a *cast*-iron stern post? Not simply because it is cheaper, more bulky, and consequently more solid—but less liable to the vibrations of material, when placed in thin layers. There have been a number of instances furnished in which the shell of iron vessels have been perforated with rocks, and by having bulkheads, or by being divided into compartments, the vessels were saved. By the politeness of Mr. THOMAS MAIN, engineer of this city, we have been favored with descriptive illustrations of the *Thistle*, a Glasgow and Londonderry steamer, built by ROBERT NAPIER, of Glasgow; an account is also furnished of the manner in which the vessel was safely brought into port, after having had her bottom pierced by rocks. We will allow Mr. J. Napier to speak for himself, as he did before the Philosophical Society of Glasgow.

Iron steam-vessels are obliged by Act of Parliament to have three water-tight compartments, which is usually done by placing one bulkhead before the machinery and one abaft it.

It is well known that many accidents have happened to vessels, which would, in all probability, have been fatal, or attended with very serious loss, but for the timely assistance of one or other of these compartments.

The "Fire Queen," for instance, a small screw vessel, originally built as a pleasure yacht for Mr. Assheton Smith, was in 1850 placed as a goods and passenger vessel upon the Glasgow, Ardrossan, and Ayr station. One afternoon, at low water, on leaving Ardrossan harbor, she struck the fluke of an anchor a few feet before one of the water-tight bulkheads; the fore compartment filled with water, and the bow sunk to the bottom. The middle and after compartments, however, kept her from entirely sinking. As the tide rose they floated her to the shore, where the cargo was discharged without damage, and the hole being temporarily stopped, the vessel steamed to Glasgow next day for repairs.

The late "Metropolitan," screw steamer, also on one of her passages from London to Glasgow, struck a sailing ship in the Bristol Channel. The ship sank in about ten minutes afterwards, and although the foremost compartment of the steamer was filled with water, she proceeded on her voyage, and

discharged her cargo at Glasgow as if nothing had happened. The foremost compartment in this case, however, was very small, as an additional water-tight bulkhead had been placed near the stem in order to make a fourth compartment. On a subsequent occasion this steamer was herself struck amidships by a sailing vessel off the south of England, but she did not sink till about *three hours* after the accident, though the centre compartment filled immediately.

Many other instances might be mentioned; the most remarkable case with which I am acquainted is that of the "Thistle" steamer, a vessel which, after striking the rocks on the North of Ireland, steamed without assistance thence to Greenock, a distance of about seventy nautical miles, across the North Channel, with the fore-deck under water, the fore and after compartments filled with water, and nothing but the centre or engine compartment free. She arrived in other respects safely at her destination.

The accompanying letter from the managers of the vessel gives the particulars of the accident, and the sketches taken partly from the vessel while repairing, and partly from the original designs, and from information received from those on board during the accident, show very correctly the appearance she presented on arriving at Greenock, and also the injuries the bottom sustained upon the rocks.

If it were necessary to lengthen this paper, many other examples might be given, but the preceding show that water-tight bulkheads of sufficient strength have been the means of saving life and property.

Care, however, must be taken in endeavoring to make strong bulkheads water-tight, not to weaken materially the general strength of the ship, by piercing the shell plates with too many holes.

From the description given at the time of the loss of H. M. S. "Birkenhead" off the south coast of Africa, it appeared that her sudden breaking up must have been owing to this cause.

Glasgow, 11*th March*, 1852.

"ROBERT NAPIER, ESQ.

"DEAR SIR,—You have no doubt heard of the accident to 'Thistle' steamer, on the evening of Saturday last, while proceeding along the north coast of Ireland in a fog. She struck on some sunken rocks, and stove in a part of the bottom plates both forward and aft. The fore-hold, after-hold, and cabins filled, but fortunately the middle compartment, forming the engine and boiler space, remained uninjured; and after she was floated off the rock, the bulkheads both before and abaft the engine space stood firm, and she returned to Greenock by the power of her own engines alone, without assistance from any other vessel, though solicited by two steam vessels to allow them to assist. The fact of a vessel of her tonnage (670 tons) steaming across the Irish Channel safely with her holds and cabins full of water, the mid-compartment of the vessel only keeping free, is most remarkable, and a strong testimony to the value of *water-tight bulkheads.*

"Those in the 'Thistle' were made particularly strong; and we think it must give you gratification as the builder of the vessel, to learn it is to that circumstance (the strength of her bulkheads) that the safety of the vessel and the passengers on board of her is to be attributed.

"Captain Dalzell, agent of the Glasgow underwriters, happened to be on board at the time of the accident; he was the only passenger who ventured to

return with her, and he tells us that but for her strong substantial bulkheads, the vessel must have gone down, and been another case similar to the 'Orion.' The case altogether deserves the notice of both shipowners and shipbuilders,

"Yours truly,

(Signed) "THOS. CAMERON & CO."

Mr. Napier illustrates the advantages of bulkheads of equal strength with the outside shell; but let us observe, in the latter cases cited, nothing is said of the cargo, whether the hold was empty or contained live stock, as is sometimes the case. Had they contained a cargo in the slightest degree above the specific gravity of water, they must have sunk, inasmuch as not only the engine and boilers were to be sustained by the midship compartment, but the vessel and cargo. For no matter how buoyant an iron vessel may be when empty and tight, they not only lose it all when filled with water, but must be carried by the buoyancy of something else. Not so with wood; if never before, then its advantages are seen. As soon as the water surrounds wood it lifts; and its buoyant properties to assist its own preservation are at once manifest. If proof were wanting of this, we have but to refer to the many vessels which have been found water-logged at sea. No one will call in question the kind of material of which they were built. No one ever knew of an iron vessel having been picked up at sea filled with water; but if we will attach any importance to the statement of Mr. Napier, we will discover that one of the greatest dangers consequent upon iron construction for sea-going vessels, consist in the connection of the bulkheads. The perforation of a course of rivet holes from deck to keel, operates the same as if alternately every other strake of plank were to butt on the same timber, from the deck down to the keel; hence we discover that the very means adopted in iron vessels to save them from torsion, the immediate cause of foundering—viz. bulkheads, are not unfrequently the cause that produce it. The loss of the Birkenhead off the south coast of Africa, was caused by the bulkhead rivet holes breaking into each other; in other words, the substance between the rivet holes gave way. It must be plain to every comprehensive mind, that at these points the vessel has much less of longitudinal strength than elsewhere. In but one single particular can we discover that iron is equal to wood for vessels; much less has it the advantage, in this particular, and this only it has the advantage, and that is on account of fire; and inasmuch as the fire always takes place about the centre, and not near the sides of the vessel, the only remedy is *iron bulkheads in wooden vessels*—they can be secured without weakening the vessel, are less bulky, less weighty, less leaky, and consequently less costly, stronger and more reliable; and notwithstanding the iron bulkhead would not float, it has, like the iron shell, while the water is only on one side, the advantage. The ship-building iron used in England is quite good enough for bulkheads, and we should think the best, because of its

being harder and stronger for the service required. It is only necessary to place a course of angle iron from the keelson to the deck beam, the vertical angle of the iron being in line with the forward side of the beam in the fore body, and the after side in the after body. This angle iron should be fitted snug to the ceiling, and when fastened with wood screws may be caulked with oakum, or it may have a strip of felt between the iron and the ceiling. Before fastening, in either case it may be made tight, and will remain so; this being done, the iron bulkhead can be riveted to the angle iron, and be secured with felt or india-rubber between the iron and the beam, and then after being once caulked will remain tight, and may, like the side of an iron vessel, be secured with angle or T iron stanchions, with this exception, they should be on both sides of the bulkhead. When this is properly done, we have no hesitancy in announcing wooden vessels to be preferable to iron, for the safety of human life as well as property; and were it not that England has an axe to grind, and would be glad to have our people turn the grind-stone, by way either of allowing them to furnish the iron or build the vessels, we are persuaded that there would be little said about iron vessels being better than wood. We have read the fable of the "Fox and sour grapes." England has no forests of oak now, of which she used to boast, therefore iron is better, consequently cheaper. But we may find profitable lessons of experience in English construction. It is the exclusiveness of the material of construction which renders iron vessels objectionable; so in like manner it is the exclusiveness of the wood in wooden vessels, which gives significance to the objections against them. In some departments wood is too weak, in others too ignitable. Pine bulkheads around an engine and boilers to hold fire, and wooden keelsons made up of several lengths to give longitudinal strength, or what is commonly called, a back-bone to a ship, which, when bolted together, and suspended in a horizontal position by the two ends, would break asunder with its own weight, are by no means reliable. Let ship-owners exercise their judgment in this matter, and let underwriters encourage the introduction of more iron in wooden vessels; then will the United States keep the advantages they possess, in being in advance of all other nations, in the efficiency of their passenger steamers, as well as in their freighting ships. When fostered by a law of admeasurement, which will make the model of a vessel consequent upon the law of utility, and not on that of principal dimensions, they then need have no fears in relation to wooden vessels.

If iron vessels would be made reliable for sea navigation, they should always have a double shell, as wooden vessels have, the inside shell being also water-tight, to which the bulkheads should be riveted, just as wooden vessels are secured; and without this provision they are not safe for passengers, as the number of iron vessels foundered abundantly prove. We would say of them as we do of wooden vessels, let there be first and second class, and only those having a double shell with the bulkheads, be regarded as first

class passenger vessels. The Lloyds alone are responsible for the bad arrangement and quality of materials of which iron vessels are built in England. Not less responsible in their own orbit are the Board of Underwriters of this city, who alone can regulate the unsafe construction of wooden passenger vessels in the United States; and with the material aid which Congress could afford, by so amending the passenger law of 1852, as to arrange all passenger vesssels into first and second class, regarding as first class only such as are provided *with fire and water-proof* bulkheads, and all the appliances for saving life on board of the vessel—by bringing her safely into port, and not by paying premiums for deserting the vessel at sea, which the Board of Underwriters virtually do, when they pay more attention to the boat than they do to the ship itself. The life-boat has furnished abundant proof of the danger of connecting the tank and bulkhead to the outside shell.

In conclusion, we say that our vessels require more strength; and the way to obtain it, is to reduce the scantling size of the frame, and increase the thickness of the planking, to give more buoyancy, and at the same time add longitudinal strength to the sides; the middle should also be strengthened and prevented from hogging, by a keelson of iron, which will also serve as a ventilator, and the best that can be adopted. With the ceiling properly caulked, the vessel would be double shelled, and then with the iron bulkheads she will be a life-boat, which the underwriters need not fear to insure, if of good model and well built.

DETROIT, *April* 4th, 1856.

MESSRS. EDITORS:—In your late number of the *Nautical Magazine*, you refer to the value and usefulness of Babbit's metal in machinery, and you further refer to the fact, that their patent was renewed about two years since.

I wish to say to you, for the benefit of the public, that the Babbit Metal Patent is a gross swindle upon the public; that their trial at Canandaigua, against the Buffalo Steam Engine Works, was a farce, resulting in a verdict which was never paid, but was allowed to be rendered with an agreement, that it should not be enforced.

Babbit's agents sued me for an infringement on their patent, in the U. S. Court, in this city. I proved that Babbit was not the inventor, and that his patent was utterly worthless, His agents tried hard to settle with me, immediately, previous to the trial, and offered to settle if I would pay the costs. I regarded the whole thing a swindle, and refused to settle on any terms. We went to trial, and I beat them. They have no sort of right to the patent; and I hope the public will not be swindled by them any longer. I live in Detroit, Michigan, and am able to respond to any damages the agents of Babbit's metal can obtain against me for misrepresentation. Please publish the whole of this letter, and oblige a swindled community.

Respectfully, E. B. WARD.

BENT TIMBER FOR SHIPS.

At this time, when the commercial world is awaking to the importance and necessity of having good ships, it will not only be a satisfaction to know that wooden ships are the best for sea-going purposes, but that their qualities may be still farther improved—that for the ill-grown or straight-grain timber of which the frames are now too often composed, we may increase their length, and have the grain continuous from end to end of the futtocks; and that the knees may also be bent to the required angles, with a length of arm and body that shall conform to the rigid demands of all. It must be a satisfaction to every man of science, to know that there are other modes of giving form to the timbers of a vessel than those furnished by the use of the axe. Having been so long accustomed to regard this as a wooden country, the only question has been, how shall we best dispose of the timber forests? Shall the finest forests of ship-timber the world has ever seen, be made into *log-heaps*, to smoulder in ruins, with nought but a mound of ashes to tell the tale? And now, but for the numerous canals and railroads, we should, at this early period in our history, find it difficult to obtain the necessary supply of ship-timber within any transportable distance of our ship-building districts. We are constrained to lift our voice, in behalf of commerce, in behalf of science, in behalf of the interests of posterity, and say to the "*woodman, spare that tree.*"

The practice of bending timber around the outside as well as the inside of vessels, has been in use for hundreds of years, and it is still continued; but it has been also well known that the most successful operations of this kind were always confined to thin plank (when the bend was very considerable) under five inches thick; and when the thickness exceeded this, (and sometimes that thickness itself, if the bend was abrupt), the plank was sawed into two thicknesses, extending for a considerable distance beyond the most abrupt part of the bend, making a tongue-piece of the inner thickness. Thus the outside thickness was relieved from the tendency to stretch or lengthen the grain on the outer surface, which could never be done without breaking; while the inner thickness was relieved from the shortening tendency, by the tongue-piece being permitted to slip, beyond its original locality. In this manner plank have been bent around vessels, where bending was at all practicable, from time immemorial; and while it was plain that the inside did not lengthen, nor yet did the outside shorten, the girth, being greater on the outside than on the inside, required that the inside should be condensed, or shortened, in order that the operation might be perfect and complete. The knowledge of this disability induced experiments on the flexibility of timber, which resulted in the discovery that the grain might be condensed, and the most difficult crooks be made of large timber. A most singular fact was also brought to light, viz., that the hardest timber made

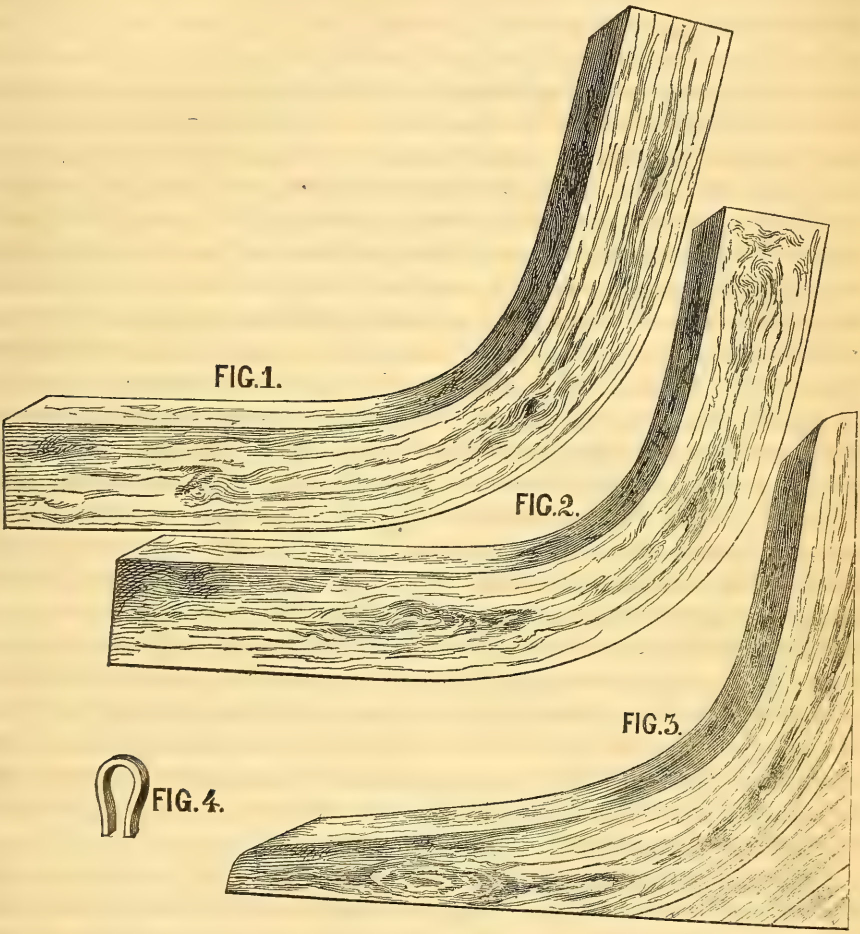
the most perfect bends. The philosophy of this phenomenon lies in the formation of the fibre of the grain. The softer kinds of timber, such as white pine and white wood, or poplar, have a long, slender fibre; and although the capillary vessels are large, and, as it would seem, afford abundant space for interlaying each other, yet the length, and consequent weakness of the fibre, prevents the application of a sufficient amount of force to interlay or upset the fibre of the grain; and the consequence is, it being too flexile to resist the pressure, the grain bends or crimps up in short angles, at intervals adapted to the rigidity of the application or to the bend to be made. This appears to be an inherent quality of the softer kinds of timber, to have a fibre of extended length and small diameter; while the more dense kinds of timber have a shorter, with greater diameter of fibre. The experiments in bending timbers of the sizes adapted to the making of furniture, and other rigid and irregular curves, by a new and different process, resulted successfully; and the principle was applied to timber of larger size, until at length live oak, 11 by 13 inches, 10 feet long, sawed square and straight, has been bent to the required crook of a second futtock, by this principle of end-pressure. When the subject was first broached and a company organized in this city, in 1853, it was not thought possible to do more than bend futtocks of very moderate size. This itself was an achievement commensurate with the highest expectations, and a pair of bent futtocks was put into the steamer Ocean Bird. It occurred to the President of the Company, after a few months experimenting, that the knees might be bent with abundant success. The inventor himself, Thomas Blanchard, Esq., at once expressed his doubts, in those unmistakable signs so well understood by his familiar friends. The fact was, however, fully established. When the time for the annual meeting came, the stockholders of the Company elected several new members to the Board of Trustees, in connection with three of the former Board, among whom was the first President, who resigned at an early day. This new organization struggled on for a time, with but little financial assistance from the stockholders in the payment of instalments on their stock. After a year spent in fruitless efforts to infuse vitality into this re-organized body, another was formed, who bought out the first, with all their rights and immunities. This organization, denominated "The American Bending Company," possessing the elements of endurance, will doubtless furnish an ample supply of knees for ships, particularly those of the larger size.

With regard to the strength, durability, and adaptation of bent knees to all the wants of ship-building, we may confidently say, that, having ourselves fully tested their strength at the time of introducing the subject, we speak understandingly, believing that they will supersede either the limb or root knee, however well grown. As to the durability, it cannot be doubted that timber, free from defects of every kind, as knee timber must be, will be more durable than the ordinary knee, inasmuch as the smallest amount of internal

defect will be shown upon the surface. But the acid with which the capillary vessels are charged is dissolved by steaming; and, while the steam prevents the air from re-charging, the process of condensation in bending takes place; thus filling up the pores while free from decomposing substances, which increases the durability of the timber.

Fig. 1 is white oak, and a fac-simile of the appearance of the grain; as also fig. 2, which is live oak.

Fig. 4 is a sail-hank for stay, which is also bent.



It will be observed, that the throat of the futtock, shown in the engraving, (figs. 1 & 2,) is one inch smaller than at the ends. Hence it must be clear that the timber is much more solid after being bent than before; and, notwith-

standing its reduced moulding size in the throat after being bent, it has also been shortened about one-twelfth of its length on the inside. This may serve to give an idea of the increased solidity of oak timber, after being bent into knees.

We have no doubt that there are other kinds of timber even better than white oak for this purpose—the larch, or hacmatack, the sweet gum, and many others, which farther experiment must reveal. We cannot avoid the conclusion that very little is yet known of the American forest growth; and it is much to be regretted that the important experiments in the staples of naval construction which were in progress in the Gosport Navy-Yard, have been lost to the government.

It will be observed, by referring to the engraving, (fig. 3.), that, notwithstanding the bent knee requires a chock, there are more grains in the throat than there are in the grown knees, and may be proportioned in the size and length of the arm and body, as the futtocks are respectively, of live and white-oak, being fac-similes of the timber required.

With regard to the feasibility of bending timber for the frames of vessels, there can be no question; and when the American Bending Company, or some other organization, shall have constructed a universal bending-mould, adapted to the infinite variety of geometrical curves contained in the forms of vessels' frames, showing its advantage in a vessel's frame, then will the demand for bent timbers for the frames of vessels be greater than the supply. We have long regarded the frames of vessels as being most defective in their proportions; the butts at the bilge, in particular, serve as so many levers operating to rend the vessel. In addition to this, they are too large. The strength of a vessel consists chiefly in the thickness of her planking, and not in the size of her frame. As a general rule, we set down that vessel as the weakest, which has the largest frame. And why? We answer: because the same amount of elasticity transversely exhibited by the vessel, that one of smaller scantling to the frame possessed, will operate with much greater force to separate the bottom and sides of the vessel; and this is a universal law, which applies to houses and bridges, as well as to ships; but to no mechanical structure is it of so much importance as to that of vessels, operated upon as they are by so many forces, and in so many directions. We say, that this principle holds good in every structure, and more particularly to vessels. The greater the scantling size of the timbers, when made up of more than one length, the weaker the fabric. This is the result of the increased size of the butt or end surface of the pieces or parts of the frame. And, on the other hand, the greater number of thicknesses the fabric is composed, (if the end surfaces or butts are properly distributed), the greater the strength, provided the length be not reduced. This will hold good of frames of vessels, of keels and keelsons, and also of the planking. How vastly important, then, that the number of butts in a ship's frame should be

reduced; and that the end-surface, or scantling size of the frame, should also be brought to its lowest practical size for utility. We at once discover that bent timber is the one thing needful for the frames of vessels, as a measure of additional security to life and property.

The United States should not only have the fastest ships, but the best carrying, the most durable, and the safest ships in the world; because they have the best materials of which to build them, leaving the question of mechanism to be hereafter determined.

INEFFICIENCY OF THE NAVY.

In view of the passage of the bill now before Congress for building additional steam ships-of-war, it was our intention to write this time under *men of war for the times;* but the anomalous condition of our navy, compared with everything else in our history as a nation, in hoarding up relics of the past, require that we first call to mind certain conditions brought about by circumstances, which we have no reason to think may not, at least in necessity for our action, rise again.

Ship architecture, in common with every art and science, has advanced at a more rapid rate during and in our career, than during the same period at any other age the world ever saw. The *old privateer service* surprises us in recollecting the youthful intuition demonstrated in the production and power of a marine militia, constituted out of such material as then formed our ships of war. But the *old privateer service* passed away with the occasion for it, and it is believed that scarcely a vestige of even the most successful of those ships which contributed so much to win for us an immortal renown in naval prowess, is anywhere now to be found, except in cabinets of curiosities.

In 1812, we appeared for the first time as a maritime power. In two years the navy fought itself into existence, and by the end of an equal period (1816) a regular line of naval policy was adopted. A navy adequate to the wants of the country was *to grow with it*, and it was decided to appropriate annually, notwithstanding the country was largely in debt, a sum of money sufficient for this purpose. Under that law most of the 74's and many of the fourth rates *still constituting part of the navy*, were built or put on the stocks. These ships have been treasured up, not as specimens of naval architecture of the times, but as part of the material and gradual growth of the most vital organ necessary to sustain a national body, whose coasting trade now requires the longest voyage known to the commercial world.

Since 1817 we have grown from a sixth rate to the first commercial power. We have become the largest ship owner in the world, and have, therefore, the deepest stake in the ocean.

In time of peace no nation has more work for a navy than we, and none in the universe has so much sea-coast to guard in case of war. Vessels now engaged in our coasting trade pass Cape Horn on their way from one of our seaports to another, and take more time to accomplish it than it does to circumnavigate the globe.

If the *old privateer service* is surprising in its recollection of our *marine militia power* about the time our navy was being brought into existence, how astounding is it that on becoming the first maritime nation on the earth—when our ships count thousands to tens—we have no more navy now than we had then!

"Gradual increase" was for a time construed into collecting materials, and then it seems to have dwindled into the preservation of relics of the past, until the unsightly forms of which it is now composed, characterize it as dating antecedent to charts and compasses. Such is and has been our navy.

In 1829, our navy had 572 guns afloat; in 1856, 537! In 1829, the expenses of the navy were short of *two and a half millions*; in 1855, *about twelve millions!*

As long ago as 1825 Paixhan brought out his shell guns. Experiments were made with them by firing at the hull of a 74, and a single shot tore a hole in her broadside through which a horse and cart could have been driven.

Though every hollow shot that hits a ship may not destroy her any more than every gun shot wound would be likely to kill a man, yet one such shell or one bullet may suffice; hence this new and destructive arm is calculated to make a small ship relatively much more formidable, by giving her the advantage of size as a target, and therefore tending to equalize nations at sea, giving the advantage, not to the one possessing the largest fleets with the greatest number of guns, but to the one that is superior in marksmanship. In 1814, when the Duke of Wellington was besieging Badajos, he sent to Admiral Berkley, who then commanded the British fleet, to borrow some 24 pounders for siege train. The Admiral replied that there were no guns in his fleet of such heavy calibre. Ships' boats are now armed with guns as heavy as any that were in 74's of that date. And if our navy is stronger now than it was in 1829, though, as remarked above, big guns were brought into notice before that date, it is wholly owing to the increased size of the guns, the utility of which has yet to be demonstrated; consequently, it may be well questioned whether we are in any way better prepared in naval implements of warfare than we were twenty-five years ago. It is palpably evident that in ships we can claim no improvement, as many of the same are still among our "efficient" men-of-war; and the

heavy ordnance of modern times would seem as unadaptable to them as would be the equipments of our fine clippers to such unsightly hulls.

Notwithstanding the importance of ascertaining in time of peace exactly what can be done with big guns, under any and all circumstances, the first regular series of properly planned experiments have yet to be inaugurated. In the result of such experiments are involved the data which will enable us to determine the size and the armament of the most effective men-of-war. With the old-fashioned guns no such questions are or ever were at issue, for a heavy-timbered frigate could lodge many shot from such in her broadsides, without either sinking or being much impaired for use. But one hollow shot is capable of sinking a seventy-four. Under the tremendous fire of heavy ordnance and hollow shot, manœuvre can win no advantage, seamanship in battle will be nothing; and the raking position, so far from being desirable, will be avoided as absolutely detrimental, for it presents the broadside to the fire, and offers the largest target. With these shot, the broadside is as vital as the fore and aft, and far more vulnerable. Therefore, with these it is marksmanship, and marksmanship alone, that is hereafter to decide the day upon the ocean. The degree of marksmanship, then, with this class of gun, is essential to their adoption. How many shot must be thrown away by *marksmen, as perfect as practice can make them*, on the average, to once strike a target? Two out of three, nine out of ten, or ninety-nine out of a hundred?

If, while rolling and pitching in a seaway, you can hit your adversary at long range nine times out of ten, then a ship is wanted to carry but few of such guns; but if, after the highest degree of perfection attainable by practice, you are only able to hit one time out of ten, then the most effective ship is that which carries the largest number. The chances are, however, that the result of diligent practice would show that big guns and little ships would produce far the most formidable navy.

But all marksmen are not equally skilful, nor all men capable of being made equally perfect; this also would be shown. Lieut. A. may be so expert as to hit a ship as far off as one of these shot can be thrown with aim, nine times out of ten; whereas Lieut. B. can only hit one time out of ten. Under such circumstances, Lieut. A. in a ship with one gun, would be equal to Lieut. B. in a ship of ten. When the skill of one man may be made to do the work of large ships and many guns, surely it is worth while to give him the practice to acquire such skill. And here, be it observed, that the training necessary to the required perfection is too costly and too valuable to be trusted to men, who, in the very next cruise, may be found serving under some other flag, when our own weapons and skill might be turned against us. Officers, and *officers only*, should be practised in firing these guns, for it must be remembered that a single shot is capable of sinking the largest

ship that floats, and the advantage of having that shot properly aimed, is of the first importance.

Two ships meeting at sea, one with a few big guns and good marksmen at long range, the other mounting only 32's and 42's, would be like unto a Kentuckian with a Minnie rifle in an open field, being approached by an Indian with a brace of six shooters. But if, on the other hand, an unpractised rifleman should be so approached, and he should be so unfortunate as not to hit the mark but one time out of ten, pistol-shot range would be reached, and the vantage ground would then be wholly changed.

In many things we follow in the wake of the English Navy. But as for adaptation, the present war found that navy by no means up to the times. Could it have been put to the test like her army, the world might have been astounded to see its real condition. England has sent two fleets up the Baltic: they both failed for the want of adaptation. After two years of dear-bought experience, she now finds herself drifting into the policy of big guns and little ships; for it appears by the official statements of the Admiralty, that there is at this moment in that service 240 steamers, mounting not over 6 guns each. Under the guidance of science the experiments might have been made, and the question determined in advance of the heavy war trial that has caused so much shame and cost so much money. She has had a practice ship in use for many years. But to expect to learn to fire these big guns with skill and accuracy in a seaway by practising from the "Excellent" at anchor in the smooth water of a harbor, is like attempting to teach a sportsman to shoot on the wing by practising him at target firing with a rest. The practice ship should exercise her marksmen in a seaway, and under all the circumstances of motion and weather, under which they would be probably called on to display their skill in actual war.

Having ascertained what such practice will enable us to do with these guns, and having ascertained also the most effective class of vessels for the Navy, the next step in the process of readjustment and adaptation, would be to solve the steam problem, and adjust the navy to suit. What is the proportion of steam to sailing vessels, or what is the combination of steam and canvas—that for a given amount of money will furnish the most effective navy?

With such problems as these to be solved; to talk of divorcing science from the navy, would be like attempting to sunder the keel from the keelson.

The expense of building, equipping, and maintaining one steamer in active service, will suffice to build and maintain two, or three, or more sailing vessels of an equal weight of metal each. How far will the power in the steamer to move at will compensate for numbers on the side of the sailers?

According to the Navy Register, the number of guns afloat in the American Navy, on the 1st of January, 1856, was 537.

According to the Navy List, the effective ships of the British Navy at the present moment, carry in all, 15,488 guns, of which upwards of 6,000 are in steamers. Now, 537 to 15,488 is great odds. And there is a considerable difference too, between our 8 steamers in commission, with their 86 guns, and the 350 "*effective*" steamers of Great Britain, with their 6,015 guns—for that is the actual difference.

These 350 man-o'-war steamers, and 15,000 British cannon, be it remembered, are exclusive of coast-guard tenders, and mail steamers.

Since 1817 we have purchased Florida, annexed Texas, acquired California, settled Oregon—extended our territory from the Atlantic to the Pacific—and if we now put all the officers together, in both the active and reserve lists, we should then have a smaller number than we had in 1817!

The number of watch officers in the navy in '17, were: 30 captains, 17 commanders, 148 lieutenants, 125 masters, and 463 midshipmen; total, 783. In 1855 the total in these grades was 779, or four short of what it was 40 years ago. The grades are different, that 's all. The following table comprehends the number of navy officers in the line for every ten years, from 1817 to 1856; captains, commanders, and lieutenants, being classed *senior* officers; masters and midshipmen *juniors:*

	Seniors.	Juniors.
1817	195	588
1827	288	410
1837	339	443
1847	480	452
1855	492	270
1856	491	65

In 1817, the oldest officers in the navy had not been in it over twenty years, and were all considered efficient; we had then 783 officers against 556 now!

Suffice it to say, the people of this country are not in the mood to maintain a large steam navy in remote seas, nor is it necessary.

The British government, with her colonies and coaling stations scattered all over the world, find a steam navy too expensive for her exchequer; and our Japan squadron had to be recalled, or a part of it at least, because of the expense of its three steamers. Notwithstanding the great diversity of opinion concerning the combination or proportion of steam and canvas, that will give the most effective navy,—and England is as much at sea upon this subject as we are,—one thing seems to be certain, and that is, that for the defence of our own waters, we must rely mainly upon steam, if we ever mean in peace to build up a navy that in war shall give us the command of our own waters. Such a navy the country needs.

To this country, and its commerce, the gulf of Mexico is but an expansion of the Mississippi river; and the Pacific states have made of the Caribbean

Sea something more than an American Mediterranean, for in it lies the pathway between the Atlantic and Pacific states of this Union ; and upon the waters of this sea and gulf, the American Navy will have to fight the great sea fights of this country, when they are fought. The battle in the first maritime war is to be fought there, or not at all. And when war comes, we must either be the masters of that field or abandon it to the enemy. To interrupt the passage through it, would be like obstructing the navigation of the Mssissippi by building a dam across, between St. Louis and New-Orleans. And yet there is not in the navy a single steamer with so much as one big gun, that in case of war, could find shelter and repairs south of Norfolk. There is not a steam frigate in the navy that can enter Pensacola or any other Southern harbor at will.

But we must cease to pursue this subject for the present. The reasons are so ample, and so multitudinous, that the navy is sadly inefficient, wholly insufficient, and out of gear altogether, that there is not a single point from which a start can be made for amendment. The whole department requires reorganization ; a responsibility at its head that will require an accountability from every member.

HISTORICAL SKETCHES OF SHIP-BUILDING.

BY A SHIP-BUILDER.

At the close of the sixteenth century, we again find the marine of England in a very depressed condition. Intestine discords had checked the enterprise of merchants, as it had many times done before in British history. England was not yet famed for manufactures, and commerce drooped with every disaster to trade, made so frequent by foreign wars and civil commotions,—the two great destructives of *commerce*, *wealth*, and *civilization.*

The successful enterprise of Drake, and the fear of the Spanish Armada, aroused the country, and the dock-yards of England resounded to the blows of the ship-builder, and a force of 197 vessels were collected to tamper the Spanish pride. The destruction of the invincible Armada followed. Spain was the first to introduce a third tier of guns in ships of war, soon after this defeat. England never built large ships for war. In 1603 there were only 2 of 1000 tons, 3 of 900, 3 of 800, 2 of 700, 4 of 600, 4 of 500, and 8 under 100 tons burthen. The ratio of dimensions in those days, were three times the depth for the breadth, and three times the breadth for the length—wide and short in comparison with the proportions now generally adopted for ships. The merchant navy of England was again reduced to insignificance about this period—most of her commerce being actually carried in foreign vessels. The Dutch had monopolized the East India trade, and Holland bid air to enrich herself at the expense of her island neighbor. King James the

First, formed the British East India Company, and the largest ship ever constructed for commercial purposes, in England, was at once placed on the stocks. When she was launched the king dined on board, and named her the "Trades Increase." She was 1,200 tons. Under his royal care British merchants again flourished, and ship-building progressed for a season. The "*Shipwright's Company*" was chartered in this reign, of which Phineas Pett, a naval constructor, was the first master. The draughts for the ships of the Royal Navy were ordered to be submitted to this company for approval before building from them; and they had jurisdiction over all ship-builders, whether royal or marine. In 1610 the "Royal Prince" was launched—the finest piece of naval workmanship hitherto produced. The keel was 114 feet long, and beam 44 feet; 1,400 tons burthen. This vessel was built by Phineas Pett spoken of, who continued principal engineer of the Navy all his life, when his sons succeeded him, down to the 18th century. This family can be traced as principal engineers, or constructors of the British Navy, for the space of 250 years. No wonder knowledge became hereditary, and art enshrouded in prejudice and musty tradition in the British Isles. There *science* as developed in ship-building never gained a foot-hold in any practical sense, while in Holland, France, and Spain, eminent writers appeared to discuss the problems involved in building and navigating ships. At an early period, English mechanics studiously concealed what they knew of the principles of their art; and mystery delved in secresy, and the result has not been flattering to their naval exhibitions. Peter Pett was a son of the inventor of the Frigate, and the ingenuity of his family deserve credit for very many improvements. He entertained a very high regard for his own invention—the frigate—and caused the fact to be engraved on his tomb. This was the first vessel ever built to make an especial trial to sail swiftly. It was 85 feet keel, 26 feet 5 inches beam, and 13 feet 2 inches deep, and 315 tons. She carried 32 guns, and 140 men. She is reputed to have been very successful both in speed and privateering adventures.

The "Sovereign of the Seas" was the first three-decker built in England, in 1637. Her length of keel was 128 feet, beam 48 feet, and 32 feet deep over all. She had three flush decks, a forecastle, a half-deck, a quarter-deck, and a round house; and more nearly approached the outlines of ships at the present day, than any example of the time. She was afterwards cut down one deck, and bore the reputation of being the best man-of-war in the world till 1696, when she was burned.

About 1650, Sir Walter Raleigh appeared in naval annals, and wrote the first work connected with nautical improvements ever written in England. His discussions opened the way for further progress, and diffused a spirit of nautical inquiry, which was beneficially felt in every department of maritime art. In his time the model, rig, and outfit of vessels received considerable improvement; and many devices at present in use, were first applied in his

time, now 200 years ago. He argues the inferiority of English ships to be a disgrace to English constructors, in view of the fact that the kings of England have for many years been at the charge to build and furnish a navy of powerful ships for their own defence, and for the wars only; whereas the French, the Spaniards, the Portuguese, and the Hollanders, (till of late), have had no proper fleet belonging to their princes or states; only the Venetians for a long time have maintained their arsenal of galleys, and the kings of Denmark and Sweden have had good ships for the last 50 years. From these facts it appears that the system of maintaining navies by the state is a modern usage of nations, except in the instance of Great Britain, and she has found no advantage in the perfective qualities of her navy in consequence of the establishment of dock-yards.

During the early part of the 17th century, the Dutch Navy rapidly increased in importance. They had wrested from the Portuguese a share of the commerce of the east, and in the then depressed state of the Spanish marine, they made bold to attempt the same thing in the west, and plant colonies in South America. The wars with Spain, in which the Dutch were constantly engaged, had a most important effect in developing their maritime power; and in 1650 their navy consisted of 120 vessels fitted for war, 70 of which had two tiers of guns; and their fleet was in all respects acknowledged to be the most efficient in Europe. From a few despicable boats, and unknown fishermen, the industry of Holland exalted her to this high ascendancy. The unparalleled growth of Holland could not be brooked in quiet by England, then under the Protectorate of Oliver Cromwell. Impediments to Dutch commerce were devised by England, and the naval victories of Admiral Blake decided the rivalry of the two nations. Seamanship and courage triumphed over mere ships. The influence of this contest improved the maritime strength of England, and enabled her to resist the unexpected, and ponderous efforts of France to wrest the coveted sceptre of the seas from the British grasp. Thus Cromwell, whatever may be said of his political errors, deserves the praise of his country for her defence at sea. He caused the Dutch to be humbled in the dust, and checked the proud ambition of France.

In 1666 mathematical science was first applied to ship-building, in England, by Sir Anthony Deane. He was the first to cast the draught of water which a ship will draw beforehand. In 1684 Sir Richard Haddock adopted the practice of Deane, and directed an inquiry to be made as to the number of cubic feet that are contained in the bodies of several draughts to their main water line, when all materials are on board for sailing. This constituted the first analysis of the royal navy.

The rise of the French naval power took place after the British defeat of Holland, in the reign of Louis the 14th; and France has ever since maintained her place second only to England, as a naval and commercial power.

When her sovereign determined to dispute with Great Britain the sovereignty of the seas, he was not only without a navy, but the means of forming one. The military and commercial marine of France had ceased to exist. But the sanguine king, by the wise counsel of his minister, Colbert, removed all obstacles, commerce began to flourish on the quays, merchant vessels to crowd the ports, dock-yards, and harbors, and shipping appeared simultaneously to start into existence; and the nation which almost for centuries had been essentially military, felt impelled to turn its energies to commerce and to the sea. It was a hot-bed growth. A navy which in 1661 consisted of some four or five small vessels, in a little more than ten years bearded and baffled the combined fleets of Holland and of Spain, and asserted the sovereignty of the Mediterranean Sea. In 1681 her fleet consisted of 115 line of battle ships, manned by 36,440 men, with 179 smaller vessels, carrying 3,037 men; and in 1690 a fleet of 84 vessels of war, with 22 fire-ships, were cruising in the British Seas. By the aid of the Dutch fleet the French suffered defeat, and gave up their attempt upon the "Mistress of the Seas." The vessels of France were of the most improved construction; but the French were always left-handed at sea-fights, and can handle battalions better than ships. One great cause of the inferiority of British ships, arose from the practice of "rebuilding" old vessels through a mistaken idea of economy. This practice completely interdicted the improvement of the model, and thus the forms and dimensions of the previous century passed down to posterity, entailing a sacrifice of blood and treasure at the hands of the British sailor, which was ill-deserved in return for loyalty and bravery in his country's cause. Our own navy in the United States bears the curse of the same folly. Our fleet is not only small, but third rate in its sailing qualities.

The French system of naval improvements was followed by the Spaniards, who gave their vessels more liberal dimensions, affording more room for working the guns, and giving sharper bodies. In the middle of the 18th century, England revised her naval establishment, and increased the dimensions of the various rates of ships in the navy. England occasionally borrowed a French or Spanish model, but really made but little progress in the attempt to excel those nations. In 1763 England alone had three-deckers in her fleet; 84's on two decks was the largest armament of the French and Spaniards, while the English in many vessels carried the same armament upon three decks. The capture of a French 84 furnished the English builders with a model ship of war, which they copied in subsequent designs. In the latter part of the 18th century, the French introduced three-deckers into their fleets—their first rates at this time were 110 guns on three decks—these ships were 196 feet long on the water line, and 53 feet 4 inches broad.

It may not be amiss to remark, that the acknowledged superiority of French models arose from the aid which science afforded to the builder, in

adapting a ship to the laws of the fluid which she was designed to navigate. The investigations of mathematicians, and men of research, into nature's laboratory of mysteries, furnished most valuable deductions for the use of naval architects; and strange though it may seem, it is nevertheless true, that experience guarantees no royal road to knowledge, or why should Britain's hoary traditions of ship-building fail to supply her dock-yards with wisdom, and her ship-yards with light, without borrowing from newly resuscitated France? The secret of the French superiority consisted mainly in the writings of her scientific men upon the construction and properties of vessels, and the art of ocean navigation. No less than ten to twenty authors followed each other in succession; while in England at the same period, or prior, the only English treatise on ship-building that can lay any claim to a scientific character, was published by Mungo Murray, in 1754; and he, though his conduct was irreproachable, lived and died a working shipwright, in Deptford dock-yard. What a reproach to the naval and mercantile interests of England! Well does she deserve to depend upon foreign authors for ideas relating to naval architecture. Had poor Murray been born to *wealth*, as well as genius, or bore a noble name to commend his scientific mind, his labors would have had immense influence upon the shipping of his country; but being, in the judgment of fools, nothing more than a *plain working man*, his lucid expositions of science fell on the ears of Admiralty Lords as a ray of light upon the caverns of the moon. Such fate falls sometimes to the pioneers of truth.

(*To be continued.*)

WE have received from the *Franklin Institute*, the several pamphlets embodying the reports of Committees appointed to test the strength of the materials for steam boilers, together with the replies of practical men and others, to a circular letter of the Committee, with accounts of different explanations of explosions, examinations of their causes, and suggestions of remedies, to lessen the frequency, or prevent their occurrence. These pamphlets embody an amount of information to be ignored by none, and worth the perusal of any practical engineer, who has not known their contents. The suggestion of Professor Bache, in relation to safety apparatus for steam boilers, is also among their number.

BOSTON BOARD OF TRADE.—The second annual report of the Boston Board of Trade, for 1856, is at hand, and a more luminous document of the business of Boston, and its enterprising and philanthropic inhabitants, it would be difficult to find. Not only the amount of resources for business, with new channels of trade are pointed out, but the report of the committee of inquiry into the causes of shipwreck, which cannot fail to awaken an interest in any humane and benevolent mind. This report does honor to the merchants and business men of Boston.

THE ADRIATIC.

The construction and successful launch of the steamship Adriatic for the Collins line of steamers, which took place on the 7th of April, furnishes additional evidence of the superiority of the Nautical over the Naval in the United States, for all the purposes both of peace and war. This vessel, like the rest of the Collins line, is intended to be adapted to war purposes when required, and notwithstanding the ship-builders of New-York have been set down as very good axe and adze carpenters, the launch both of this ship and of the Niagara have abundantly proved that they can at least launch ships of superior size, if not of quality, without, as was the case in the launch of the Roanoke, breaking 11 of the deck beams, or of the Minnesota, in breaking 17 knees of the orlop deck, nor yet the Wabash, in springing the spar deck beams clear of the stanchions. We think that some, at least, of the Nautical mechanics of the commercial metropolis have now earned, if they were not before entitled to, the name of ship-builders. It has been one of the "customs of the Naval service," for the commanding officer of a Navy Yard to claim the credit due a successful launch. We are not, however, advised in relation to the claimant of the honors attendant upon the launch of the vessels we have named; the Commandant would not surely change the "customs of the service," to avoid responsibility. Be this as it may, it is quite certain that Mr. Steers, who built the Adriatic, launched her.

In endeavoring to offer an apology for the injury done to the Minnesota in launching, we are told that the broken knees were rotten, and that had they not been, they would not have been broken; so much the worse, alas, for our Navy! We had supposed that the chief, and indeed the only advantage in having Navy Yards and constructing government vessels, was found in the superiority of the materials and manner of construction. The most prejudiced in favor of the "customs of the service" will not deny, that the work on the Niagara is superior to that of any of the other five vessels built under the late act of Congress; and now that it should be said that the materials of any one of the vessels were rotten, is indeed too bad. Who was the surveyor?

The dimensions of the Adriatic are as follows:—

Length	345 feet.
Breadth	50 "
Depth of hold	33 " 2 inches.
Register tonnage	4,144¾ tons.

U. S. STEAMER POWHATTAN.

THE *Franklin Journal* for April, contains some remarks, denominated by the writer a reply to the Editors of the *Nautical Magazine* for October, 1855, on the performance of the U. S. Steamer Powhattan. We would be left in doubt, whether the writer intended this reply for the Editors of the English, or the *U. S. Nautical Magazine;* but for some quotations it contains, we should incline to the belief that it must have been intended for our trans-atlantic friends, inasmuch as the writer has not touched the argument, but spun out his remarks in interrogatories, to which we shall respond, presuming he is as ignorant as he represents himself to be. We would call particular attention to the "grave errors" the writer attempts to show in our article of Oct., 1855. Had we been particular to show up the performances of this ship, and the Susquehannah, (of which so much has been said,) in all their glaring discrepancy, we should perhaps have made an unanswerable argument. We are not disposed to exaggerate or make things worse than they really are in our Navy, there being no occasion for it. Patriotism forbids our removing the veil; we only desire to exhibit just enough to provoke National legislation, and prevent presumptive imbecility from rioting without control.

Performance of the United States Steamer Powhattan—Reply to Remarks in the Nautical Magazine, for October, 1855.

Having been for some time past absent from the United States, it was not until very recently that the remarks in the *Nautical Magazine* of October last, in reference to an article published in the *Journal of the Franklin Institute* of the preceding month, on the performance of the U. S. Steamer "*Powhattan*," came to our notice.

The author of the article on the performance of the "*Powhattan*," does not consider himself responsible for misrepresentations or false inferences of any one who may choose to place himself in the august position of a critic; but, inasmuch as the editors of the *Nautical Magazine* have fallen into several grave errors, we take the liberty here of referring to some of them, without having, however, any disposition to enter into a lengthy discussion of the subject; for there is no doubt in our mind that any disinterested person, competent to judge, cannot come to the same conclusion that the editors of the *Nautical Magazine* have, in reference to the "*Powhattan.*"

First, then, they say: "It is this *difference* of *construction* that has rendered nearly all the past efforts of naval constructors abortive in this country, which engineers seldom think of."

This is certainly very gratifying information, and I have not the slightest doubt but that *engineers* will feel truly thankful for having their attention called to the matter. The inference is obvious: that *engineers* were not before aware why a ship of inferior model could not attain the same speed, with an equal expenditure of power, other things remaining the same, as a

ship of superior model! But listen again. They say, "it is the model and disbursement of materials, which make the *difference* of *construction*, growing out of a mistaken notion of the laws of resistance." Now, we would like to inquire if "the model and disbursement of materials" did not make a difference in the construction of a ship, what would? But, it does not appear quite so conclusive to our mind, that "the model and disbursement of materials" of a man of war, are occasioned by "a mistaken notion of the laws of resistance." A mere *ipse dixit* on this point does not strike us to be very good evidence. We do not pretend to say, however, that the model of the "*Powhattan*" could not be improved, but until we meet with a war steamer that is capable of attaining the same speed that the "*Powhattan*" has attained, and is as strongly built, we are willing to take her for sea-going purposes, notwithstanding the abortive efforts of naval constructors in this country. The truth is, too much is expected of the steamers of the navy. They are expected to be swift steamers, fast sailers; to consume much less coal than is required for a merchant steamer of the same size; to carry a large armament and sufficient coal for long voyages; to outrun all merchant vessels they meet; to never have any accidents to occur to their machinery. In other words, to perform miracles; and if they fail in any one of these particulars, they are in consequence denominated abortions.

Again, we quote. They say "we have a new feature presented by this writer—he would call attention to the *masts, spars*, &c., as disqualifying the vessel from acquiring the same facility of movement that a merchant vessel would acquire."

Such was certainly the intention of the writer, and he has no reason, from any thing that has subsequently come to his notice, to change his mind. We suppose the editors of the *Nautical Magazine* are aware, that the time sail can be set on a side wheel steamer at sea, compared with her total running time, is very small, and that, when going head to wind, the resistance of the masts, spars, rigging, etc., necessarily prevent her from attaining the same speed, every thing else remaining unaltered, that she would attain without them. This resistance is considered in the merchant service more than sufficient to counterbalance any advantage desirable from the sails in case of fair winds; for which reason the masts and spars are reduced to a minimum for safety, should the machinery become disabled.

Once more. Referring to the average speed of 10·63 knots the hour, they say, "it is plain to every *practical mind*, that this vessel has done her best in a smooth sea and with a fair wind, and that she has due credit for it."

In referring to the abstract log, we remark that the sea was *not* smooth, but that it was light during the first day, and for the remainder of the time it was moderate. Leaving this, however, out of the question, we cannot see *why* it is plain to every *practical mind*, that this vessel did her best. If a little more information had been given in the *Nautical Magazine*, and fewer assertions, it strikes us that it might have been followed by beneficial results, even to the *practical mind*.

We take it upon ourselves to say that our convictions are not in accordance with those of the editors of the *Nautical Magazine*, and that this vessel did *not* do her best. Our reasons for assertiug this are the following:—

It must be manifested to any one, that when a steamer like the "*Powhattan*" does her best, it must be under the most favorable circumstances of wind and sea, with all the sail set she is capable of carrying, and the engines worked

up to their maximum power. Such was not the case with the "*Powhattan;*" for the quantity of coal allowed to be consumed per day in the boilers of a steamer belonging to the navy, is regulated by the captain, and he accordingly directs more or less to be burned, as he desires the speed of the ship to be increased or diminished; taking advantage always of fair winds to reduce the coal to a minimum, unless there be an object to make a passage within a certain time. In the case in question, the quantity of coal consumed was 45-59 tons per day, of so inferior quality, that it gave an evaporation of only 4-07 lbs. of water per pound of coal. Now, as the boilers of the "*Powhattan,*" as stated in the article on her performance, evaporate $2\frac{1}{2}$ lbs. more water than this, per pound of coal, it follows that had the coal been of a good quality an equal amount of power would have been secured by the consumption of 28-24 tons of coal per day.

We see that the resistance of the ship was reduced to such an extent by the sails, *i. e.*, the engines were relieved to such an extent, that this amount of coal propelled her at the rate of 10-63 knots per hour. Now, then, inasmuch as the wind was on the quarter, increasing the speed of the ship from 10-63 knots to 12-8 knots could not sensibly reduce its effect on the sails; and assuming the power to increase as the cube of the velocity, without going into any minute calculations, we have

$$10{\cdot}63^3 : 12{\cdot}8^3 : : 28{\cdot}24 : 49.3,$$

the number of tons of coal required to propel her at the rate of 12-8 knots per hour with the sails set, as in the case under consideration. The boilers of the "*Powhattan*" are capable of, and have consumed coal at the rate of 75 tons per day, (for the truth of which we respectfully refer the skeptical to her log books.) If she had consumed this amount of coal in the above case, the power would have been increased 52-3 per cent. over what would have been required to propel her at the rate of 12-8 knots, which we fancy will be conceded by any disinterested person to be quite sufficient to balance any assistance derivable from the small amount of sail set. Hence we have no hesitation in repeating, that with an unlimited supply of good coal, with a mean draft of 17 feet 9 inches, in smooth water, she is capable of attaining a speed of 12-8 knots the hour without the assistance of sails."

In relation to the "grave errors," viz., "difference of construction," of which engineers seldom think, when computing the efficiency of steam power in marine engines, "the obvious inference," etc., growing out of a "mistaken notion of the laws of resistance," we would inform the writer that the *quantity and density* of the materials, as well as the "model and distribution," have something to do with the speed of our steam ships. Secondly, we say, let any practical man, whose organs of vision is not set at an obtuse angle, witness the performance of any paddle-wheel steamer belonging to the U. S. Navy, note the altitude of the line of flotation when the ship is in a state of rest at the bow, at the wheel, and at the stern, and then again when under steam, and we affirm that he will at once conclude with us, that Naval constructors and Naval engineers have mistaken notions "of the laws of resistance." It betrays an amount of ignorance unworthy of marine engineers

to insist, or assume that they do, or can compute the amount of resistance on a steamer's model under such circumstances, having a line of flotation elevated from one to two feet at the bow and stern, while at the wheel it is depressed about an equal amount. We leave this question with the writer to settle to his own satisfaction. The information which has been given is not founded on *speculation* of what this vessel *might do*, nor was it wholly made up of the writer's data, but from what she *has* done, and the best she *has* done, collated from official documents prepared for Congress; and we will go farther and say, that the writer is mistaken in his data, and so far from underrating this ship, we have given her credit for more than she has done, and this will also appear manifest to a "practical mind." The writer's "fancy will not be a sufficient inducement for us to give credit to biased data. The speed of paddle-wheel steamers cannot be determined correctly by the log; the current following in the wake of the wheels, and in the wake of the ship, should be deducted from the knots given, and if the log is cast obliquely from the wheel-house, its angular direction is not reliable for the determination of the speed of the vessel. Why did not the writer tell us what speed was obtained from 75 tons of coal per day? We are more interested in his proof than in his "fancy." The power indicated in the boiler, and that applied at the centre of the paddle, differ materially. Again, we have his assumptions of what this ship could do with a given draft of water and plenty of good coal. Has she ever done it? If not, why not wait until she does? She has had three years service, been to the East Indies, to Japan; and if this is not long enough to make a trial trip, let the writer take more time, but let us have *facts* not *assumptions*. The point in our argument was in reference to the masts and spars, which we were led to "suppose were additional helps," because the wind was fair and the sail was spread upon them; they certainly could overcome their own resistance with a fair wind. And it matters not so much whether the power was applied to the spars by the force of a fair wind, or to the wheel by the power of steam; certain it is, that the wheels were no encumbrance—they, like the spars, overcome their own resistance by the aid of steam; and whether the power applied should be accredited to the engines, or to the sail, we will leave the writer to determine, requesting him to keep us advised of the time when the expected speed shall have been attained, that we may duly credit the ship. As to the false inferences or the misrepresentations to which he alludes, the world will be better able to judge who made them, when the writer shall have furnished all the facts which have not yet appeared. The *power*, whether of the whole Navy, of a single ship, or of an engine, is only available in the ratio of the ability it possesses to overcome opposing force, whether that opposition be a ship of war, or a fluid body. Progress is as much an element of success in war as in peace; and what is speed in vessels but progress? We may deceive ourselves by assuming that we can accomplish certain results, but if

the time should ever come when we shall have occasion to use our Naval force, we shall find ourselves chagrined at our imbecile efforts to improve. This "information" may not be the kind that the writer asked for, and may be regarded quite as gratuitous as was that imparted in October last, but we deem it important to our readers, notwithstanding. The writer would be glad to see a war steamer superior to the *Powhattan.* We refer him to *the Russian Navy*, whose people are regarded by the English as *barbarians*, but to day they have a more efficient navy than that of which the United States can boast; and we speak understandingly on this point, having examined the models of their vessels. The Russian Navy has 84 gun ships with easier lines, and sharper than any sailing frigate in our Navy, and equal, if not superior, in speed to the famous *Powhattan*, of which the writer feels so proud.

In conclusion, we will add, that although the writer has no "disposition" to enter into any lengthy discussion, we tender him the pages of our Journal in order that his correspondence may appear simultaneous with its appearance in the *Journal of the Franklin Institute.*

THE BEST FORM OF SAILING VESSELS.

A CORRESPONDENT of the Scientific American, under the above caption, in the number of April 19th, thus writes:—Out of a great number of experiments with different sized models, the following was the most satisfactory: With a 20 inch model (2 inch beam) I tried the relative values of straight and curved floors, and I am constrained to believe that the latter is the best. With the straight floor and keel the model was drawn through still water 60 feet, by a seven pound iron sinker, the line passing over a horizontal staff in ten seconds. The sinker was then changed for a four pound lead, which required 14 seconds to accomplish the same result. The model was then cut down to convex curves, and the length divided into sevenths; forward three-sevenths shaped to a curve whose circle would be 600 inches in circumference, and aftermost four-sevenths, to the curve of a circle of 840—nearly a parabolic curve; that is, in a ship 200 feet long the curve from forward to *centre of motion*, and abaft that, would be respectively 1000 and 1400 feet radius. The model, when so altered, was drawn through the water by the seven pound sinker in nine seconds—a gain of one-tenth; and by the four pound sinker in 12 seconds—a gain of one-seventh; the buoyancy of this flotant was incomparably superior to the straight keel.

Now, we undertake to say, for the edification of this writer, and any others who may be inclined to squander their energies, that the farther they go in these kind of experiments, the less they will find they know about the best forms for sailing vessels. The only thing the writer has learned

from his experiments is, that which every mechanic should know, whether he builds houses or ships, viz., that short vessels with round lines are more buoyant than long vessels with straight lines, for the simple reason that there was a greater proportion of breadth after the length was reduced, and, consequently, a greater proportion of buoyancy, inasmuch as the weight of the model was being reduced much faster by shortening than by reducing the breadth. Now, why all this trouble with models, when a strip of paper of half the size might have sufficed to show even greater results?

Colonel Beaufoy spent a long time in experimenting on blocks of wood, and after publishing a large quarto volume of over 400 pages, had only learned that he knew just nothing about the subject of which this writer has learned so much. We say that whatever is worth knowing is worth printing; but, really, the results of this writer's investigations are only worth printing for the purpose of exposing the very common error into which he has fallen. There are a thousand varying conditions in which such experiments cannot enter; hence, they are only calculated to deceive and endanger human life. The subject of best models is of too much importance to be trifled with in this manner. Every change of model is an experiment; hence, every new vessel built, if the shape has been changed, is an experiment. In this sense, the writer is on the platform with the builders and masters of vessels—an experimenter on the models of vessels. But why this experiment to learn that which every school-boy may find in his school-books, viz., that wide vessels are more buoyant than narrow ones, inasmuch as the circle is the shortest boundary line containing an equal area of flotative surface.

London, *March* 31st, 1856.

Admiralty Movements.—The *Shamrock* screw gun-boat was commissioned to day at Deptford Dock Yard.

Five 13 inch sample mortars have been received at Woolwich for the proof department.

The screw gun-boats, *Manly* and *Mastiff*, were tried in the Lower Hope to-day, at the measured mile, and realized the average speed of 8½ knots per hour. These vessels do not materially differ in size from our first class sloops of war, and have a draught of water *not exceeding ten feet.* Steam gun-boat is but another name for steam sloop of war.

UNITED STATES MAIL STEAMER FULTON.

BY ERASTUS W. SMITH, RESIDENT ENGINEER TO THE "NEW-YORK AND HAVRE STEAMSHIP COMPANY."

VESSEL built by Smith & Dimon, under the superintendence of Captain William Skiddy. Engines by the Morgan Iron Works, George Quintard, proprietor.

DIMENSIONS.

	Feet.	Inches.
Length on deck	290	
Breadth of beam	42	4
" over all	65	6
Depth of hold	31	6
Tonnage, Custom-House	2,300	
" Carpenter's measurement	3,000	
Diameter of cylinders	0	65
Length of stroke	10	
Diameter of paddle-wheels	31	
Length of paddles	9	
Number of paddles in each wheel	28	
Width " "	0	18
Shafts of wrought-iron.		
Diameter of crank-journal	0	18¾

BOILERS.

Two of iron, with vertical brass tubes; one boiler forward of the engine, the other aft.

Length of boiler	12	0
Width "	30	0
Height exclusive of steam-chimney	14	0
" inclusive of "	26	0
Height of smoke-chimneys above steam-chimney	40	0
Diameter of " "	6	0
Total amount of fire and heating surface	9,100 sqr. feet.	
" grate surface	343 "	
Number of furnaces in each boiler	7	
Draught of " "	natural.	
Length of grates	7	0

Description of coal—outward passage, anthracite; homeward, bituminous.
Maximum pressure of steam to square inch, 25 pounds.

The Fulton has three decks, the upper or spar-deck is flush, and surrounded with galvanized iron-netting. Round-house aft, with division for wheel and binnacle. Captain's room, smoking room, first officer's room, six water-closets, and circular stairway leading to main-deck saloon.

Companion-house midships, facing aft, over stairs leading to main-deck saloon cabin.

House between smoke-chimneys 65 feet long, with engineer's, doctor's, and purser's room; entrance to stairway and gangway around engines; first and second kitchens. Pilot-house forward; this is an important feature, inasmuch as the helmsman can see as well, and as soon, any danger ahead, as

the forward watch, and shift the helm, without waiting for the word to be passed aft; this is in addition to the reserved steering-wheel aft. On the forward deck is Captain Skiddy's (Brown's patent) anchor-capstan, bitts, and deck stoppers, by which 32 feet of cable are hove in per minute. On the forward guards is the water-closets, and the baker's and carpenter's shops are on the after guards.

There are also on the spar-deck three double-acting hand fire-engines, with 600 feet of fire-hose. There is also provided 8 life-boats, 6 of iron, (Francis' patent,) 2 of wood. Every boat is provided with water, provisions, sails, oars, etc., and on sailing, the passengers are numbered for each boat. Every boat is officered and manned, the officer's rank being painted on her; and there are regular station-bills throughout the ship, appointing every one of the crew to their places in case of fire or collision.

Below the spar-deck and on the main-deck is the dining-saloon, of satin, rose, and zebra wood, with cornice of white polish and gilt, table and sofa seats to accommodate 150 persons. The after ladies' boudoir is in the style of Louis XIVth, oval panelling fresco. Paintings, stained glass, gilt mouldings, and ornament. The ladies' toilet contains marble-top stand, china bowls, bath-room, with hot and cold water; on opposite side is Captain's private room, bar, and pantry; passage on starboard side leads to ice-houses and lamp-rooms. Forward ladies' boudoir finished with white polish panelling, gilt cornice, and mouldings; state-rooms for 150 passengers. Barber's shop, second dining-saloon, store room, etc., on this deck.

On the berth-deck are accommodations for 150 first and second-class passengers. The orlop-deck has the mail-room forward, lined with iron; and aft is the wine-vault, large enough to hold 6000 bottles. The cabin and joiner's work throughout is indeed creditable, and well worthy of Andrew Mills, Esq., at whose hands it was furnished.

The Fulton can accommodate 300 passengers, carry 800 tons of coal, and 700 tons of freight, with a draught of water of 17 feet 6 inches.

The frames at bottom are of oak, with long filling-in floor-timbers of oak, making the floor solid the entire length of ship. Frames at keel moulded 17 inches, sided 16 inches; timber and room, 32 inches. Frames from floor-heads to spar-deck clamps, plated with bars $4\frac{1}{2} \times \frac{3}{4}$ inches, cross-laid at angles of 45°, riveted together at their intersections with each other, and each bar bolted to every timber it crosses.

The bottom is double planked to load-water line. There are eleven tiers of keelsons on the floor of the ship, extending from midships and chiming in toward the ends. She is square fastened throughout, and the thick-work or plank inside, is bolted vertically or edge-wise between every frame. There are four bulkheads athwart ship in the hold, and two fore and aft, forming a box 105 feet long, 18 feet wide, enclosing the engines and boilers. The longitudinal bulkheads are of double plank and timber, stiffened with

diagonal and cross-laid riveted iron straps, similar to frames of ship, and furnish great longitudinal strength where most required in every vessel. The space between the latter bulkheads and sides of ship is appropriated to coal, and the ports through which it is taken into fire-room are fitted with slide-gates, which can be shut tight, and keep the fire-room free in case of accident, causing the compartment to fill with water.

Engines.—Two inclined oscillating engines, one cylinder forward, the other aft, making with each other an angle of 90°, and connecting upon one crank-pin which connects the two paddle-wheel cranks, there being no "centre shaft" in the arrangement; by which is saved the centre-shaft, two centre-shaft cranks, one crank-pin, two engine-frames, and two pillar-blocks. The channel-plates do not, as in most other forms of marine engines, form any part of the foundation or frame-work of the engine, and together with the air-pumps, feed-pumps, bilge-pumps, injection and bilge-valves, are under the cranks, and all open to the view of the engineer, and accessible when the engines are in motion. The air-pump beams are of wrought iron, worked by links connecting with crank-pin.

The engine-frame is a combination of cast and wrought iron in the form of the letter A, being in section of one of the trunks between pillar-block and cylinder trunnion, 18 inches wide by 3 feet deep. The sides and bottom of trunk are of plate iron, $\frac{3}{8}$ inch thick, riveted with $\frac{3}{4}$ inch rivets, in three and four rows. Cylinder trunnions are $24\frac{1}{2}$ inches diameter. The head of cylinder is fitted with a guide-yoke extending beyond the stuffing-box, and embracing the piston-rod. This is a new and valuable arrangement, as it takes the pressure of piston-rod in oscillating the cylinder, and saves the stuffing-box from any unusual wear.

The cylinder-valves are of the usual balance, poppet variety. The arrangement for operating them and effecting a cut-off, is new and ingenious. It is the invention of Mr. Hermann Winters, of the Morgan Iron Works. There are no rock-shafts in the arrangement, but there is to each cylinder three revolving shafts, by the motions of which, with their appendages, the lifting and lowering of the steam-valves is accomplished by two distinct motions, the lowering being the quickest. The same shaft also gives to the exhaust valve a greater average opening than is obtained by the common rock-shaft. The point of cutting off is variable and adjustable while the engine is in motion. A combination of this arrangement admits of the engine being reversed instantly, and worked back full power, with the eccentric "hooked on," without shifting it—a feature of very great importance.

The boilers are of the variety known among engineers as the "Martin boiler," and for which Daniel B. Martin, Esq., Engineer-in-chief to the United Stated Navy, has a patent. The tubes are of brass, without seam; being drawn from brass ingots by the American Tube Company, Boston. The water passes through the tubes and the fire around them, the same as

LITH. OF ENDICOTT & CO. N.Y.

NEW YORK AND HAVRE STEAM SHIP COS.

U. S. MAIL STEAMER FULTON.

2300 TONS.

in the vertical tubular boilers, which have for five years performed efficiently and economically on the New-York and Liverpool U. S. Mail Steamships, where they were first successfully introduced through the enterprise and liberality of E. K. Collins, Esq. In the Collins' boilers the tubes are located directly behind and adjoining the furnace, and take the "direct action" of the flame. In the Fulton's boilers the tube-box is located *over* the furnace, and take the "return action" of the flame. The latter plan has been adopted for all the new government steam-frigates and the new Collins' steamer *Adriatic.*

The engine department is provided with two of Worthington's steam fire engines and bilge pumps, of extra large size; the steam cylinders being 16 inches diameter, and made expressly for this ship. They are operated for port use by a small auxiliary boiler, but at sea are connected with the main boilers, and in case of fire or leakage, would perform very efficient service.

The engines are surrounded with three ornamental iron galleries, affording great convenience for inspecting every part of the machinery. The whole was arranged by Mr. Myers Coryell, constructing engineer for the Morgan Iron Works, under the superintendence of the Company's resident engineer. No attempt has been made to secure extraordinary speed, not having had a proper trial trip, before taking her place in the line. Pirsson's fresh-water condensers are to be added on the third voyage, when more steam will be produced for an equal combustion of fuel.

The Company deserve credit for their patronage of new things, without which, no improvement or progress could be made; and we are indebted to the confidence and liberality of Mortimer Livingston, Esq., the agent, for an opportunity to make the first application of the simple and effective oscillating engine to trans-Atlantic navigation. He is also the first to apply the athwartship and longitudinal bulkheads in steamships constructed of wood.

She is also furnished with a supply of the *patent graduating life preserving seats*, which will be fully advertised in our next issue.

The accompanying illustration exhibits the style of rig, and is a correct representation of the ship.

SHIP BUILDERS' APPRENTICES.

WE have arranged our pages to give place to such remarks and illustrations as will, in our judgment, be best adapted to this class of our readers in every issue. It is not to a knowledge of the use of the edge tools required in the construction of vessels, that they must look for the accomplishments requisite to constitute them mechanics. It is not that man who is most expert in the use of the *axe*, *adze*, *and maul*, or who can work out the greatest number of foot-hooks,* or edge the most plank, who is the best mechanic. By no means! This is all art without science, and art unmixed with *science* is drudgery. It requires something more than the use of the physical powers of a man to constitute him a mechanic. It is not less true that the mind makes the mechanic, than that the mind makes the man. If the present and future generation of apprentices learn only the use of edge-tools, what will they know about a ship? And what could they do toward building a ship? Little indeed! Simply because the drudgery of ship-building will be done by machinery. Twenty-five years will not have passed away, when the frames of vessels will be made of bent timber, and the present waste of the axe in the ship-yard will be recorded only in memory, and on the historic page. The wooden ships of America will then weigh one-third less than they now do, while the iron ships of England will weigh at least as much more. Freighting ships will sail faster and carry more than they now do. All this must be accomplished by *science*. The mind that conceives, and the hand that executes, may be concentrated in the same man, but the hands alone can do nothing; the axe falls powerless, and like the sword, is no friend to improvement, is an enemy to progress. Not one particle of all these wondrous achievements we have enumerated will be accomplished by the axe, or the hands that use it, unless aided by science. How vastly important, then, must it be, that the mind should be educated—that those now in their mechanical pupilage should gather, like the bee, sweets from every opening flower! But how can this be done now that the school-boy hours of leisure have flown away? We say redeem time—let the precious hours of rest be all employed, in sleeping, learning to think, in learning to act. "There is no royal road to geometry," said a philosopher to his sovereign. It is equally true that there is no royal road to Marine or Naval Architectural Science. Mechanics are not made in theatres, ball, or bar-rooms. It is not the amount or the kind of work apprentices have done during the day from which they learn the most, any more than it is the food they have ate which makes them strong; but it is the amount which they digest. Just so with the young aspirant of the ship-yard—the evenings are his digestive hours, and if they are squandered, how can he grow wise? It is impossible. In a country like this, where education in

* Commonly called futtocks.

the common branches are dispensed like the dews of heaven; where there are no hereditary barriers to keep the apprentice from the most elevated and distinguished positions, his success is placed in his own hands—he is to a very great extent the arbiter of his own fortune. Nor are we insensible to the vast amount of responsibility that must rest upon those who undertake to teach; we feel its weight, we realize its importance. But we say in advance to the apprentices in Nautical Mechanism of the United States, that we can do you no good, unless you come sufficiently near us to become familiar, and to hear or read what we may have to say or write; and being unable to see and lecture the apprentices in Nautical Mechanism, we shall write to them from month to month, and the only way in which we shall know that we are doing them good, will be in the responses to our efforts, and in the questions they may feel free to ask by letter, to which we shall readily respond in the magazine.

A CRUISE ROUND OUR NAVY-YARDS.

For the first time since throwing down the glove to the navy, we have made a cruise among our newly acquired patrons with basket in hand, avowing ourselves in broad day-light to be on a chip-gathering expedition. The warm hand of friendship, and an abundance of attention, has spoken volumes of welcome, and notwithstanding we hurried along to see all that was to be seen in the shortest possible time, trusting our minds only with the notes, yet we find ourselves in the unhappy predicament of having seen and heard too much to write about, and too much to keep silent on. Severe criticism, however well deserved, might seem unkind to those who differ with us, and things so treated might turn out to be unseen by some of the delightfully fair company with whom we ship-visited. If it does turn out that we have seen more than they, surely they will excuse our peering, on the ground that we were cruising to see, and they for pleasure. We do not, however, mean to say, that we did not also see much with pleasure, for it could not be otherwise while in such pleasant company.

Norfolk, Washington, and Philadelphia, were the ports we made, in the same succession here named.

The yards are all busy, and each has a prominent object—a new Steam-Frigate in process of construction and repair; this latter feature, by the way, as applied to new ships, being peculiar to government yards.

These much praised and much abused ships were to us of prime interest; Norfolk (on account of its great commercial and ship-building interest?) being doubly attractive by the Merrimac's first casting anchor there, after her "most satisfactory trial trip" from Boston.

Of our antiquated naval ships, Norfolk has a large collection, which, in contrast with the present state of ship-architecture and equipment, are annually increasing in interest by the increased difference between them, and the progression which characterizes America's greatest pride—the finest ships in the world. But as these old caricatures are subject to being fitted for sea some of these days, and in that case calculated to disgrace and belie our just eminence in the science of ship-building, we earnestly recommend that they be re-transferred to the stocks and launched, in order to effect their timely destruction.

The Roanoke seems to have been easily got into shape again after having proved herself to be so weak in the *loins*, and we trust that the callosities which deform—despite the putty and paint—eleven of her deck beams, may make her not only as strong, but much stronger than she was before. Her inside arrangements are not yet sufficiently far advanced to warrant a notice. The Colorado, on the stocks, is in a good state of forwardness, and can be got ready at an early day for launching.

But *the* one of the new Steam Frigates is the Merrimac. After turning from the old hags already alluded to, on approaching her she has striking beauty, which unfortunately wanes on closer examination and familiar intercourse. She in every aspect displays the idea that massiveness gives strength. Heavy, heavy throughout. When she clears the capes of the Chesapeake in our whole line of coast south, she can enter no other port, save, perhaps, with hard rubbing Key West. Increase of beam would not only have lessened her excessive draught of water, but would have remedied another defect of great magnitude, want of room to work the guns on her spar-deck. If she had room to work them, she could carry guns of the same calibre on the spar deck that she now has on her main-deck; but owing to her model and build, the spar-deck is so narrow as to create the necessity of moving her eight inch guns aft and forward, in order to make room in the gangways, which are still much encumbered by spare spars: these are here bundled together, in accordance with old allowances for dull frigates, without the advantage of steam, and are rarely or never required for use in half the quantities that are taken. Besides, the propulsory power in spars and sails should be so arranged as to make a smaller number necessary.

On her main deck she is pierced for 34 guns, has 24 9-inch (73 pounds) shell guns, mounted. On her spar deck 2 10-inch shell guns, on pivots, and 14 8-inch shell guns, in battery.

This mixture of calibres is much condemned by the officers, and justly, we think, as a ship should, at least, be capable of bringing her greatest force to bear at whatever point. In all, she is pierced for 64 guns, but only has 40 mounted. Why these 40, at least, could not be of the largest calibre, we cannot understand. They could be worked on the quarter-deck and forecastle, and, possibly, by removing the unnecessary spars, in the gangways.

The pivot guns are mounted on complicated and unwieldy carriages, which have required a great outlay of unnecessary work; and being mounted on the extreme fore and aft of the ship, with the already heavy weight of the bowsprit, estimated at eighteen tons, and the propeller and fixtures at sixty tons, are, with her waste of buoyancy aft, calculated to *kill* her in a seaway.

OLD-FASHIONED EQUIPMENTS, AND INEFFICIENCY.

Berth-deck, 5 feet 9 inches in the clear, is dark and gloomy in the extreme, although just improved very materially by the removal of part of her coal-bunkers, and cutting additional air-ports. The hatches round the engines are all bulkheaded in. As her steam power is considered *auxiliary* only, and not expected to be used except on extraordinary occasions, and the bulkheading in of these large hatches, as we were informed, intended to increase the draught, we think they should have been built of canvas, or, at least, made moveable, for the benefit of the whole ship's company. There are two large mess-rooms amidships, still further obstructing light and air, and as the steerage for the Assistant-Engineers is larger and more comfortable than that for the midshipmen, on the opposite side of the deck, who have quite as long a probation, and is an innovation conflicting with proper ventilation, and, consequently, with the health of the ship's company, we think it ought to be removed. The mess-room for the forward officers is no less obnoxious and unnecessary. They each have a large state-room in which to pass their time, or be private when not on duty; and a moveable screen to be used at meals would not only give them the needed privacy, but give them a much better country in front of their rooms, by sweeping away entirely both of these obstructions.

These things away, so that Jack could see how to clear the tremendous hitting-against-your-head beams, and it would be bearable, though an exceedingly efficient round-shoulder modeler.

The Sick Bay is certainly the best constructed anti-skulking apartment we have ever seen. Not light enough to write without a candle, small air-ports, and not even a water-closet! A place well calculated to make well men sick, and not calculated at all to make sick men well. One who has experienced the natural dread of going to the "head" in bad weather at sea, even for well men, and clearly comprehend the amount of sickness on board ship from this cause alone, can well imagine the shuddering horror of being compelled to go, rather than submit to a close stool on so grand a scale as the Merrimac's Sick Bay. Such a Bay is a nuisance—a great deal worse than none at all, and it should at once be turned into the berth-deck. Besides, it is high time that all exposed "heads" should be covered. It would contribute more to the health of the ship's company than any sanitary regulation hitherto adopted.

The Wardroom.—On our way hither, we passed an old-fashioned cap-

stan, only on step, the chain-messenger; and, looking aloft, the old chain lightning conductor—the most prison-like apartment intended for social privileges we were ever in. An excessively large country, which seems to be mashed down by the near approximation of the great timbers which brace or break one's head as he shuns a knee here and a beam there, are its prominent characteristics. The state-rooms are of the ordinary size; the bulkheads between them put up without any regard to the beams and knees—except it be to bring said obstructions in the middle of the room—might have been made much more comfortable by increased size, and improved the country by taking from it. On board frigates especially, officers care less for large country in the ward-room than they do for comfortable state-rooms; hence, there is no necessity for its extraordinary size. For airing or a walk, the gun-deck is far preferable, while the state-room is the three years' tenement for all home-like privileges. This could be easily, and should be, altered, by moving out the state-room bulkheads; and the first lieutenant's room should extend forward, giving a door on the berth-deck corresponding with the chief engineer's. To make amends for this on the berth-deck, the ward-room store-rooms should be removed from there, and placed abaft the aftermost state-rooms, by the pantry, where they would be both more useful and more convenient.

Engine room, and even propeller passage, we went into. Everything here indicates excellent workmanship, is in first-rate condition, and "works admirably," on the evidence of good engineers.

We have thus particularly noticed this ship, because she is the only one of the six yet in a condition for fair criticism. She is, undoubtedly, the most powerful ship we have ever had in our Navy, and we wish her every success in the completion of her trial trip, and for the future. But her faults are too numerous and too great to have passed them by in silence.

In Washington and Philadelphia we were politely waited on, and our Yankee liberty of questioning was courteously tolerated and frankly answered. The Wabash and Minnesota can both be better described when in a state of greater completeness. Appearances now are, that the Minnesota will be much the most comfortable ship of the five so nearly alike. Her gun-deck is two inches (6 feet 2 inches) higher, and her bulkheadings are arranged with proper regard to beams and knees. We shall have much more to say of these ships hereafter.

As Naval Journalists, it is our duty to exercise fair criticism, and we do so, in ignorance of, but without fear or favor of the parties on whom our remarks fall. It may not—it *is* not—always our privilege to become acquainted with the particulars of naval matters, which are too often deemed of less concern to the nation, than to a few individuals, whose private interests and motives may be affected by a publicity just to the community; but in proportion to our knowledge we spurn the principle which shields the

guilty and inefficient parties with a mantle of secresy, at the risk of national honor. We profess to be as much interested in a naval ship of the United States as any one, and it is no vain-glory in us to say, we have at least as much charity for the private interests of parties whose reputation is at stake in them, as they have for those who are "more fortunate"—more *fortunate*, indeed, applied to the mechanism of launching a ship!

Why, we have heard it said that the reason the Niagara did not break in two when she was launched, was because the others did; that in consequence of that, Mr. Steers took up and laid his ways over again! His removal was of those laid by previous naval constructors.

Why did the Roanoke break *eleven beams* in being launched?

Why did the Minnesota break *seventeen knees*? We have heard an officer in the navy say, that it was because they were rotten when they were put in!

Why did the spar-deck of the Wabash spring clear of her staunchions?

Are we to infer that the constructors of these ships never heard of an *accident* to a ship in her launching? Is it enough that it was a most *unfortunate* thing for them? It does not appear so. Would that it was an unfortunate thing for somebody—anybody, who is responsible for it.

BONNICE'S SEA SOUNDING INSTRUMENT.

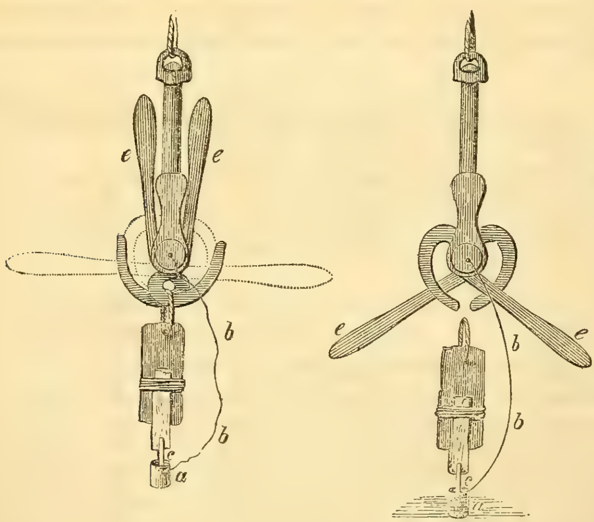
A LETTER of Captain T. Spratt, of the R. N., to Captain Washington, R. N., Hydrographer to the Admiralty, published in the English Nautical Magazine, is descriptive of this instrument, and reads as follows:—

H. M. Steam vessel Spitfire, off
SEVASTOPOL, 13th *November*, 1855.

SIR:—Having for some time given my attention to the best means for obtaining correct soundings at great depth, and tried several instruments for this purpose, no instrument that I have ever seen or heard of equals for ingenuity, simplicity, and neatness, the instrument I now bring to your notice by a model and drawing, the latter of which accompanies this letter and description, The inventor of this new and clever "deep sea sounding instrument" is Carmelo Bonnice, a Maltese, and the blacksmith of the Spitfire since she was commissioned in 1851. Several instruments for this object having been previously made by him, in the course of the past year he produced the one now recommended for a fair trial in depths and conditions that do not occur in the sea I am now employed in. But it has answered perfectly in depths of 300 fathoms and under; and I have no doubt will answer equally well in any depth yet reached, where it is desirable for the weight to become detached on reaching the bottom, tand not possible

during its descent. The advantage it possesses over the American instrument, of a rod passed through a shot, described by Lieut. Maury, U. S. N., and which has been so generally used by Lieut. Lee in the recent voyage of the U. S. ship Dolphin in the Atlantic Ocean, is obvious at first examination, viz.; in its application to any kind of weight that can be slung with a single white line becket or loop. Thus a pig of ballast, an old fire bar, or an elongated weight of any kind can be used, which, from its more rapid descent than a spherical body (a shot, as used by Lieut. Lee, U. S. N.), possesses great advantages under circumstances of sounding where there is a superficial current. With the instrument is used a small cup or hollow cylinder (*a*), containing some arming to bring up an indication of the bottom. This is fastened to the instrument by a small wire or line (*bb*), and is attached, by the two projecting points (*c*), that act as springs to grasp the end of the weight, if sufficiently pointed, or to a piece of stick lashed to the pig of ballast or weight for the purpose, as (*a*). It will be seen that the weight is taken up by the instrument by placing the arms (*ee*) in the position shown in fig. 2, so to open the double hook connected with the arms. And with the arms placed erect, as in fig. 1, the sinker is held by the instrument during its descent; but on reaching the bottom it becomes released through the two arms falling downwards by their gravity.

This being one that may be of great use in every survey, I trust the inventor will meet the reward his ingenuity merits, and that it may be generally adopted in all our surveying vessels.



With this instrument and the use of a silk line I trust to be able to obtain the greatest depths that can be found in the Mediterranean or the Black Sea—having nearly ten years used a silk line for depths of nearly 1000 fathoms with great success; this being rapidly obtained, and not vitiated in any appreciable amount by the influence of local currents, or from the little friction offered, and the short time the weight is in consequence descending.

ECONOMY OF HIGH PRESSURE STEAM.

English Engineers have recently extended their investigations upon the comparative merits of high and low pressure steam. Special attention seems directed to the economizing of fuel, by working steam of high pressure up to its full expansive powers, by cutting off at a minimum ratio of stroke. We present a brief summary of results, as published in a London Journal.

The quantity of steam being equal in all cases, but allowed to expand so as to occupy increased spaces, from twice up to ten times the first space, we have the following increase of power developed :—

1st. Space occupied by expanded steam : 2nd. Ratio of power developed :

1	2	3	4	5	6	7	8	9	10
1	1.7	2.1	2.4	2.6	2.8	3.0	3.1	3.2	3.3

Making allowance for minus pressure, through loss of temperature while expanding, the increase of power from expansion alone will be in the ratio of about 2 to 1.

High pressure steam is more economical than low pressure, as the follow-table will show.

Table, showing the power developed and the volume of steam at different pressures, produced from the same volume as water, and consequently with the same consumption of fuel. *Volume of water*, 1.

Total pressure (including atmosphere) in lbs. per sq. inch.	Volume of steam.	Steam not expended	Steam ex. power com. dev. with ordinary practice*	Steam expanded down to 5 lbs. pressure, and back pressure of 2lbs deducted. Part of stroke at which steam must be cut off to exp. to 5lbs.	Consumption of fuel for same power	Capacity of cylinder for same power.
15	1669	.66	1.24	1-2.7th	80 p ct.	3½
20	1281	.71	1.46	1-3.5	68	3
25	1044	.74	1.64	1-4.3	61	2¾
30	883	.76	1.78	1-5	56	2½
35	767	.78	1.91	1-6	52	2⅜
40	679	.80	2.02	1-6.6	49	2¼
50	554	.82	2.22	1-8	45	2
60	470	.83	2.37	1-10	42	1⅞
70	400	.84	2.50	1-11	40	1¾
80	353	.85	2.62	1-12.6	38	1¾
90	316	.86	2.66	1-14	37	1⅝
100	287	.87	2.83	1-15.6	35	1⅝
110	266	.89	2.91	1-17	34	1½
120	250	.92	3.00	1-18	33	1½

This table shows how the ordinary practice may be improved upon ; for example, by using steam of 120 lbs. pressure, and cutting off at 1-18th of

*Ordinary practice is assumed at 35 lbs. total pressure ; cut off at 3-4 of the stroke—the power developed being called 1.

the stroke, three times the power will be developed from the same combustion of fuel. The amount of economy obtained by using steam at increased pressures may be found from column 4. For instance, steam at 50 lbs. pressure, cut off at $\frac{1}{8}$th the stroke, gives 2.22 times the power obtained in the ordinary practice, (that is, with 35 lbs. steam cut off at $\frac{3}{4}$ths;) so that the same power is obtained by the combustion of 45 per cent. of fuel; or in other words, the saving is about 55 per cent.

LETTER FROM MR. MOORSOM OF H. M. CUSTOMS, LONDON.

We take pleasure in acknowledging the receipt of a letter from Mr. Moorsom, of London, whom we have already introduced to our readers as the author of the best system of Tonnage ever adopted, and now the Chief of Bureau of Ship Registration in Her Majesty's Customs. The more immediate object of Mr. Moorsom's letter being to undeceive us in relation to a supposed misapprehension, on our part, in regard to the discussions upon the subject of Tonnage in England, we take this occasion to furnish a word of explanation, due to all or any of our readers who may have accepted our remarks in the same light as our esteemed correspondent. We can best introduce the text for our remarks by the following quotation:—

"Having just received the January No. of your national work, and not having had time to look into the preceding No. for December, I was induced to refer to the latter, in which I read your paper on the newly established tonnage law of this country. I need not say the high gratification I felt at the estimation expressed of the result of my labors; indeed it would be mere affectation on my part if I were not to acknowledge the honor I felt at the approval of one who cannot fail to be considered an authority in such matters on both sides of the Atlantic.

If I could have stopped here, a fresh impetus as well as encouragement would have been given me, notwithstanding my impaired health, to have continued to assist in the good cause. But finding that in the January No. of your Magazine you now view our new law in rather a different aspect, I have lost all hope and confidence that the question will ever be brought to a satisfactory settlement as regards the two countries, either severally or internationally. In explanation of these latter observations, I have to observe that I read in your January No. of the *Nautical Magazine* as follows:

"It is but too evident from the discussions of British Shipowners and builders, that a considerable number of eminent disputants would have preferred a law for tonnage based on the *external* cubature of shipping." With regard to this quotation I can only assure you, that you have been altogeth-

er misled. The only discussion which has taken place on the subject is one which was got up by a Mr. Henderson, a retired Ship-master, aided by a Mr. Atherton, the marine engine maker of Woolwich Dock-yard. The former person has no pretension whatever to science of any kind; the latter, though I believe a talented man, is perfectly ignorant of naval architecture. Mr. Atherton lately delivered a lecture at the Society of Arts on "Tonnage Registration," and, although every effort was made to induce the Shipowners and Shipbuilders of London, as well as of the out-ports, to attend the lecture, they succeeded in obtaining the attendance, I understand, of only one Iron Ship-builder, namely, Mr. Scott Russell; not *one* Ship-builder, I understand, gave them his countenance."

We regret that so great a misapprehension of the meaning of our remark, quoted by Mr. Moorsom above, should have been entertained by him. In explanation it is only necessary to state, that at the time of penning our article commencing the January No., we had not read the lecture or discussion referred to by our correspondent, (although we have since,) but alluded to discussions prior to the adoption of his system of Tonnage by the government of Great Britain. Mr. Moorsom's "Review of Tonnage," and contemporaneous publications, disclosed the basis of our remark.

Mr. Atherton's scheme for Tonnage Registration is unworthy of notice; while Mr. Henderson's would accomplish neither one thing nor the other in regard to the true *internal* or *external* measurement. We regret that our correspondent should himself have been mistaken in the meaning of our remarks. We hold Mr. Moorsom's system of Fiscal Tonnage above all reproach for the objects and the commerce for which it was so skilfully and scientifically designed; but as we endeavored to show in our January No., this system appears inadequate to the entire wants of commerce in the United States. To say the least, very important modifications would become necessary to render it applicable to the multifarious kinds of shipping used in this country. We have taken our position that both displacement and *internal* measurement should be used in appreciating our marine tonnage, and shall labor for the adoption of our own system, while we assure Mr. Moorsom, and the British public, that his system shall go hand in hand with our own, if our counsels can prevail.

We see clearly the advantages of an international Tonnage system; but while we wish to see Mr. Moorsom's adopted in this country, we cannot be derelict to duty, and neglect to point out its partial ineligibility to certain classes of shipping, more especially when we have in view another mode which can be worked in harmony with it, and thus jointly secure advantages which cannot, in our opinion, be reaped by either alone.

The high degree of satisfaction given to the maritime interests of Great Britain, which will be more fully shown by future favors from our correspondent, in which he will describe the practical working of the new law,

for which he has been appointed to Her Majesty's Customs to supervise, will be made manifest to our readers in our next issue.

In conclusion, we would say that our idea of external measurement, or cubature of displacement, includes the external bulk of the vessel, to the height of upper deck, and not to any ideal "load-line," "impossible to find." And to any, if such there be, who feel quite competent to demonstrate, that even if all the cargoes that required to be carried, were of dead-weight, *external* measurement could not be made to apply, we would in all candor and respect propose the problem of *tonning* an American lake or river steamer, or one of the thousand coasters whose broad decks carry from two to three fifths of their cargoes. English ships are inhibited, by act of Parliament, from carrying timber on their decks. The Underwriters of this country are beginning to move in the matter of determining the amount of cargo proper to be carried in vessels, which we hope will lead to the adoption of principles in this matter.

THE CONSTRUCTION AND MOORING OF BUOYS AND LIGHT-SHIPS.

THE proper construction and mooring of Buoys and Light-ships are oftentimes fraught with the most important consequences; and the safety of shipping very frequently depends upon the buoy or the light-ship for an index to the dangers, as well as the harbors of a coast. To the casual thinker it might at first appear, that but little knowledge of the laws of flotation would be required to construct and moor either a buoy or a light-ship; but put such an one to the task of accomplishing either of these works, and his short-sighted opinion would soon become manifest. Our attention has been called to the subject of this article from the reading of a paper by Mr. G. Herbert, in which we find the following account of preparing and mooring buoys recently adopted in England:

"It was desired to have a stationary floating body which should have a tendency to ride easily, and to retain its perpendicularity, whilst the point of attachment of the mooring chain would be in such a situation as to subject it to the least amount of strain. With his view, a wrought iron pear-shaped buoy was constructed, of a circular form in plan, and terminating above in an apex, so distributing the weight that the centre of gravity should be situated a little below the centre of the plane of flotation. The bottom was made concave and raised up internally, so as to form a cone, to the internal apex of which the mooring chain was attached.

A buoy of 9 feet in height, 6 feet 6 inches diameter, exhibited, under all circumstances of wind and tide, an upright body of seven feet out of water. This quality of retaining its vertical position, arose from the force of the tide or wave, being simultaneously exerted upon one side of the exterior of the buoy, and on the opposite side of the interior cone.

Encouraged by the success of the first experiments, a wrought-iron sea-beacon was constructed on the same principle. The floating base was 20 ft.

in diameter. It drew 4 feet 6 inches, and supported a tower, also of wrought iron, 28 feet high, 7 feet diameter at the base, and 3 feet 6 inches diameter at the top, surmounted by an iron ball of the same diameter. This beacon was moored at the Goodwin Sound, and was admitted to be the best and most conspicuous sea mark ever laid down. By some casualty this was sunk.

It was now proposed to erect upon a floating base a tower sufficiently large to serve as a substitute for a light house.

These light houses might be moored in any depth of water, and thus be advantageously employed as guiding lights, doing away with the present system, in which the majority of lights rather warn from a wrong channel, than guide into a right one, and thus insuring to all vessels a safer and a speedier navigation."

It may be said that the whole science of these constructions lies in this, *to ride easily*, for it is the violence of the sea which breaks the moorings and occasions the loss or wreck of light-vessels. The first condition in constructing floating fabrics to ride out seas with safety, lies in the *form* of the submerged body; the second, in the location of the centre of gravity, and the third, in attaching the mooring chain.

The form of the body given in the example by Mr. Herbert, is very ingenious for buoys, but the same result might be arrived at through a variation of the experiment. In the first volume of the Magazine, page 35, we endeavored to elucidate some of the laws governing the motions of water, and showed that an immersed body, if formed for sustaining a *uniform* pressure from the surface to the lower extremity of the body, would possess the elements of *natural stability*; and the vertical sectional outline would present a "concave form." If the reader will examine Mr. Herbert's description of the buoy, he will discover that the excess of buoyancy, if any, beyond a distribution according to the law of *uniform* pressure, was at, and near, the surface, where, also, the centre of gravity was located, and where the mooring chain was attached. Here, then, we have the centre of displacement, the centre of gravity, the centre of hydraulic pressure, and the centre of inertia, (or mooring,) nearly coincident, and the result of this neutralization of forces, exhibited under all circumstances, of wind and tide, an upright body, &c.

In mooring light-ships—could the principle of mooring as above be adopted, the result would be manifest in the ease with which the vessel would lie at anchor—the violence of her oscillations being due only to the state of the sea.

We do most unhesitatingly repudiate the *models* of our present light-ships, and are prepared to furnish improvements in shape, which shall be based upon the laws of flotation.

The number of disasters to vessels of this character might be materially reduced, while the comfort of the keepers might be vastly augmented during storms, by the adoption of superior models for our light-ships.

[From the English Nautical Magazine.]

NARRATIVE OF THE LOSS OF THE CHINESE JUNK NINGPO,

On D'Entrecasteaux Reefs, near New Caledonia : with an account of the Reefs.—By. Lieut. William Chimmo, of H. M. S. "Torch," ordered to their rescue.

THE lorcha Ningpo, William Billings, Master, sailed from Hong Kong on the 15th of April, 1854, bound to Port Philip, in ballast; there to be employed as a lighter. She experienced light variable winds until the 21st, when it came on to blow a heavy gale from the N. E.; which continued until the 23rd, the vessel laboring heavily. On the 26th, passed between Orange and Monmouth Islands, and found the chronometer had gained 2′50" on its original rate; which was attributed to the violent motion during the gale.

Wood and water getting short, determined on putting into Port Lloyd, (Bonin Isles), on the 29th of May, in company with the Exchange, Chinese Coolie ship, with 697 passengers, from Hong Kong to San Francisco. On making the land, found the watch still gaining, its error being 5′45" above the original error. While at this port procured a supply of wood, water, sweet potatoes, and turtles. Here it was the intention of the master to have beached the vessel, to fire and black her bottom; but owing to the barrier reef and the insufficiency of rise and fall of tide, was prevented.

Sailed from Port Lloyd on the 5th of June, with a strong breeze from S. W., and heavy rain, which continued until the 20th. The vessel now made much water, and it was at first intended to put into the Isle of Pines, but her course was afterwards altered for Moreton Bay.

On the 22nd July, passed close to the westward of Tucopia or Barnett Island: wind strong from S. E., with a high and confused sea, thick weather following.

On the 28th July, at noon, strong breezes and cloudy, with a high sea; the N. W. end of Bond Reef, by account, S. by E., twenty-five miles distant; wind E. S. E.; steering S. S. W., in order to give the N. W. end of the reef a wide berth. At 4 P. M., ordered a mast-head look-out, but nothing could be seen. As the vessel had been going six knots since noon, the master felt convinced all dangers had been passed; but, as the chronometer was in error, the same course was steered (S. S. W.), until 8 P. M., when the vessel was hauled up S. S. E. After the watch had been relieved, and the look-out stationed, the Master went below to consult the chart, leaving orders with the chief officer, whose watch it was, to keep a good look-out for breakers until he came on deck again, and to put the vessel round immediately, if he saw any thing suspicious,—the vessel now going about five knots.

The Master says:—He had not been more than ten minutes below when he felt a slight shock. He at once ran on deck, and to his dismay found the Ningpo hard and fast on a coral reef. Although going so fast through the

water, the shock was so trifling that his first impression was, that he had run foul of some portion of a wreck; as the day previous a vessel's lower mast was passed. At the time of her striking, no surf or breakers indicated the proximity of danger, and the vessel went on as easily as if she had been run on a shingle beach. This idea was, however, quickly dispelled. On looking over her side, the bottom was distinctly visible, with several rocks (?) showing above the water. Having got sail off the vessel, (after fruitlessly attempting to back her off,) one watch commenced discharging the ballast while the other got up and bent one of the anchors, which was taken aft, and let go, to prevent her drifting further on the reef. This was hardly done, when the vessel began to make water rapidly. Sails, provisions, and every thing were got up from below, and in less than fifteen minutes the vessel was half full of water. Daylight appeared, and showed the utter hopelessness of their position. The vessel lay with only two feet of water alongside at low water, with her stern projecting over a ledge, outside of which was no ground at forty-five fathoms: the vessel's bottom stove in, so that the tide flowed in and out.

Two small sand islets were seen about six miles due west; immediate preparations for landing the provisions and crew were made. At 10 A. M. of the 29th, the first load was dispatched, on a raft made of the spare spars, &c. This raft did not reach the islet until next morning, the water being too low on the reef. The remaining portion of the provisions had to be headed up in water casks and towed on shore, as the raft was not able to return to the vessel, and the only boat on board was too small to carry a cask. It was not, therefore, until the fifth day after the vessel struck that every thing was landed.

Commenced sinking holes on different parts of the island to obtain water, but without success, salt water always being found at the depth of ten feet. This was a source of great anxiety, as only two casks and a half of water were saved from the wreck, and one of these spoiled by the salt water safely getting in.

As to provisions, there was no immediate apprehension, as the island was covered with various kinds of sea fowl, and the reef swarming with a variety of fish, including sharks of an enormous size, (having captured one with a harpoon, sixteen feet in length,) and turtle, a few of which were seen, and they succeeded in taking one weighing over 600 lbs.

The difficulty of obtaining water was soon overcome, by condensing the salt water from the ship's coppers. A gun barrel was introduced into them and by the application of cold water outside the condensed water, poured through the nipple of the gun into a small water cask.

By these ingenious means, eighteen gallons of water were obtained in twenfour hours; much water was saved during some passing showers.

Having brought all the provisions on shore, and being unwilling to trust

the boat any more going off to the wreck, (as she had been stove in once), knowing that all their hopes depended on her, they commenced fitting her a canvas deck and wash boards ready for a passage to the Isle of Pines, that being the nearest port where assistance could be procured. This design was, however, frustrated by the men who had volunteered at first to go, refusing afterwards, saying they were afraid of the natives of New Caledonia and the adjacent islands, but if the Master would go to the coast of Australia they would proceed with him. This, in a boat thirteen feet long (over all), and very lightly built, was not considered prudent, as the boat could not carry provisions and water for so long a passage. At last, after many days spent in fruitless endeavors to induce them to abandon this apparently mad scheme, he consented to attempt the passage to Moreton Bay, provided they would wait till the middle of September. This was agreed to, and everything was going on smoothly until the 27th of August: when, according to custom, the Master went out at daylight, on the North end of the Island, to look for turtles, remaining until eight o'clock. On his return he was informed that some of the men had taken books, spy-glass, &c., from his tent.

"This," to use his own words, "he thought nothing of, until he found his charts and Nautical Almanac had been taken, when the horrible suspicion flashed across his mind that they contemplated running away with the boat.

He at once started, to prevent, if possible, such a proceeding; but when he arrived at the beach, it proved that his fears were well founded, as the boat had already shoved off, and was out of musket-range. Heart-sick, and in a state bordering on despair, he returned to his tent, to see what had been taken, and found charts, navigation-books, and spy-glass gone, leaving him without any guide to go by in the event of being able to construct a raft. The crew now came, one by one, to excuse themselves for the share they had taken in the affair, offering as an excuse that they feared the boat was intended for the Isle of Pines, and they had a dread of the natives there.

The master now tried to induce the crew to build a raft of the wreck of the Ningpo, as he never expected to hear anything more of the boat; but without avail, as they said "they had no tools, and that the whalers would be coming about in a short time," and they would be sure to see the flag-staff that had been erected on the north end of the island. This he considered a very poor chance of getting away, as no sailing-vessel would ever come near such a place.

Every preparation was now made for a long sojourn on the island, by keeping a vigilant look-out for turtle, which now began to come ashore in great numbers. Two large pens were built, and upwards of eighty, weighing on an average 5 cwt., were put into them.

The pens being full, they commenced drying the flesh of others, to provide against the time they would desert these shores—which they do during

the months of November and December, after depositing their eggs, and return as early as July; increasing daily from this period, they were so numerous in September, that the Master turned twenty-seven over one morning, without wetting his feet; and he counted eighteen more asleep in about six inches of water, which could have been captured without difficulty. In addition to turtle, quantities of fish of different kinds were caught, all of which were excellent food. These fish were principally of the cod species, but much larger than any before seen. One was harpooned, which weighed upwards of 700 lbs. It was black, with large scales of an inch in diameter; the flesh was palatable, but tough, and full of sinews.

A canoe which had been found in the centre of the island, was now fitted with out-riggers, sail, &c.; and they were thus enabled from time to time to visit the wreck, which had not yet broken up.

They had now been two months and a half on the island, and lost all hopes of receiving any assistance from the boat, which every person gave up as lost; when one of the men, (Lyttle,) who had been always willing to do anything the Master proposed, agreed to venture in the canoe, over to an island they had seen to the S. E. This island he afterwards found to be Surprise Island, bearing S. S. E., about thirty miles from the one on which were the crew. Everything was therefore arranged, and on the morning of the 7th of October she started, at 4 A. M.; but had to put back, the sea being too rough, and the canoe filling. At 6h. 30m. started again, with the intention that if they could discover land south of Surprise Island, to stand on and endeavor to reach New Caledonia. She arrived at Surprise Island at sunset that evening, completely exhausted, having had to paddle all the way against a head sea. Could see nothing like land to the southward, and returned next day to the island.

Another effort was now made to build a boat, but some refused to lend their aid, although saws had been made out of new iron hoop, (which on trial worked pretty well), and some cutting tools out of a ship's cutlass. They then all volunteered their assistance. Water now ran very short, and operations were postponed until a supply should be provided, as the weather threatened rain. Two days afterwards it commenced, and continued seven days, enabling them to fill every available receptacle. During this period the wind, which continued to blow half a gale, raising a high sea, prevented them going to the wreck.

On the 26th, they were about to commence their boat, when the Master was informed that a vessel was in the offing. At first sight, they supposed her to be a whaler trying-out. In order to attract notice, large fires were made on each extreme of the island, where quantities of wood had been placed for the occasion, and the ensign was hoisted on the staff, union downwards. From the various movements of the vessel, they were thrown into great suspense, fearing that the fires had not been seen, and they were

doomed to remain on this island without the hope of rescue. However, on her near approach, the report of a gun gave them intimation that their signals of distress were observed. The vessel advanced towards the island, as near as it was safe, and sent her boats to their assistance. Their joy may be more easily imagined than described; they had given up every hope. The same evening they were all housed on board H. M. steam-vessel Torch, commanded by Lieut. William Chimmo, R. N.

WILLIAM BILLINGS,
Late Master of the Ningpo.

Notes by William Tough, Chief Mate, who made a voyage in the Ningpo's boat, to the Coast of Australia, nearly eight hundred miles.

He says, that, as soon as the boat and sail were ready, Mr. Dainty (a passenger), one seaman, and himself, started for the mainland on the 26th of August. On the 28th they had rain, and a strong wind from the S. E. On the 6th of October, saw land in lat. 26 S., and short of water, proposed to land. When near the shore, natives were seen; and when the boat was close, two of them swam towards her and were taken into her, seeming very friendly. They could speak a little English, and told them they could get plenty of water on shore. The natives assisted them to get out of the boat. Afterwards, they took away everything out of her, and then wanted the crew to take the clothes off their backs, but they would not do so. They then struck them with clubs, and, being so weak, they could not defend themselves. Tough's right arm was broken, and his head cut severely; the seaman and passenger were also wounded, and left insensible on the beach. Tough was the first to come to, and he found he was lying with his head and shoulders just out of the water. He found he could not stand, and crawled on his hands and knees to some water. He took some also to Mr. Dainty, which revived him a little. The seaman continued insensible until the following morning, when they all started for Moreton Bay.

For four days they had nothing to eat. They fell in with a native named Moysa, who took them to a hut and gave them some fish. He told them he would take them to Moreton Bay, and early next morning they started. After walking half a mile, Mr. Dainty and the seaman could go no further. They told Tough to proceed and send them back assistance, if possible. After walking two days, another tribe was met, who said they would see him safe to Moreton Bay. Moysa was sent back to see what he could do for Mr. Dainty and the seaman.

Tough then proceeded with one native six days, during which time they had to swim several bays and creeks, which was found very painful with a broken arm and the skin burnt off his back by the sun. Two days before reaching Moreton Bay the natives gave him a covering for his back; which was very acceptable, as he had been naked for ten days.

On their arrival at Moreton Bay they were taken to Captain Wickham, the government resident, who sent them to the hospital, where they remained a week. Two boats were sent to look for Mr. Dainty and the seaman; the latter only was found, and they were told the other had gone to Wide Bay.

Tough returned to Sydney, when he was sent on board H. M. Steam-vessel Torch, Lieut. W. Chimmo; which vessel was immediately despatched by the senior naval officer, at the earnest request of the Colonial Government of New South Wales, to rescue the survivors of the Ningpo; which she successfully accomplished on the 26th of October, 1854, and carried them all safe to Sydney.

William Tough,
Chief Mate.

A Cursory view of D'Entrecasteaux or Bond Reef, during the search of H. M. Steam Vessel Torch, for the survivors of the crew of the Ningpo, by Lieut. W. Chimmo.

This dangerous and extensive reef, North of New Caledonia, occupying a space of nearly 1,000 square miles, is an invisible coral reef, with only a few large rocks or stones on its margin; one of these in particular on its N. W. end is nearly twenty feet high. This reef has two openings on its western face, and one (?) on its eastern. The former lead to small sand islets; and from the centre island I think there is a passage through the reef.

The North portion of this reef was seen by Captain Bond, in the Royal Admiral, in the first attempt to make the great eastern passage to China, 28th November, 1792. North Huon Island was also seen, and said to be the only one. Earlier in the same year (1792) the south part was discovered by Admiral D'Entrecasteaux, as well as Surprise Island. It is stated, "to be the most dangerous reef he ever saw."

This reef encloses four small islands, of about two or three miles in circumference, viz., North Huon, in lat. 18° 2′ S.; Middle Huon, in lat. 18° 18′ 37″ S.; and South Huon, with Surprise Island on its South extreme; also a few small sand islets and the rocks above mentioned.

North Huon Island has a good and safe anchorage from easterly winds; but should be carefully approached, particularly by sailing vessels, having many sunken coral patches two to three miles W. N. W. from it, which is the channel. The landing is good, on a steep sandy beach, having eight feet of water over the boat's stern when her bow is on the beach. This island abounds with turtle, fish, and sea birds, but no water.

Middle Huon is safe of approach; but the anchorage is bad, irregular coral bottom, in twelve fathoms, close to the fringe or inner reef which surrounds the island, and renders it difficult and dangerous for boats to cross. It is in lat. 18° 18′ 37″, and abounds with turtle, fish, sea fowl, and landrail.

It was here the crew of the Ningpo lived for three months, but they found no water, although wells were dug eighteen or twenty feet deep.

South Huon has also a fringe reef round it, and is still more dangerous of approach for boats than Middle Huon; being more to the westward, it has not the advantage of the shelter of an outer reef. This island is about south, four miles from Middle Huon.

Surprise Island, so called by Monsieur D'Entrecasteaux, when he thought he had weathered the north reef of New-Caledonia, is S. S. E. twenty-six miles (about) from Middle Huon. The Master of the Ningpo landed on this island, and describes it "the same as the other islands." I have not seen it.

The current found on the west face of this reef was generally influenced by the winds, and to the N. N. W. The rise and fall of water for five days' hourly observations gave on an average three and a half to four feet. The current set through the reef and round the extremes of the islands, at the rate of two to three miles per hour.

From the Ningpo another wreck could be seen, which shows its fatality to more than one vessel. Her name I could not ascertain, nor is it known whether the crew had landed or perished. They were not, nor had been on any of the islands in this reef.

The Approach to the Islands.—Directions.

It was found that the west face of this reef, instead of being a continuous line north and south, forms two deep bights. The N. W. extreme may be known by several rocks fifteen to twenty feet out of the water—one, the highest, much resembling a boat's lug sail.

The N. W. extreme forms one arm of a deep bay strewn with patches of coral (awash); in the bight of which lays North Huon Island, of crescent shape, magnetic North and South, and forming, with its sand spits and coral patches, a good anchorage open to the westward on ten points of the compass.

The course for this anchorage is to bring the centre of the island E. S. E., distant five or six miles, and steer for it, keeping (with the sun to the West) a good lookout for the small coral patches awash directly in the entrance and distant from the island two or three miles. Gradual soundings, from fifty to ten fathoms, will be carried to the anchorage.

The centre portion of the reef has not so much western extent, and forms the south arm of North Huon Bay. It is a detached reef from the main, and is connected with the islands and islets. South Huon Bay is of much greater extent; the depth of which is formed by Middle Huon and South Huon Islands and two sand islets. Here the anchorage is not safe or good, and the ground foul. The islands are entirely surrounded by a fringe reef, only passable for boats on their lee or N. W. side at high water, which makes it dangerous to cross, a heavy sea rolling over it. I had not time to

examine Middle or South Huon Islands; but the late Master of the Ningpo stated it was more dangerous of approach than Middle Huon, but contained more soil, and a similar abundance of turtle, fish, and birds.

The S. W. point of this reef, forming the south arm of South Huon Bay, is an abrupt point with deep water close to it. Between Middle and South Huon Islands there is an apparently clear passage as far as the eye can reach to the eastward; but I had not an opportunity of examining it, nor would the unsettled state of the weather allow me to take the Torch through on my return.

Admiral D'Entrecasteaux showed great discretion in making the whole ontline of the reef unapproachable by a continuous line, as no sailing vessel should attempt to approach it.

Brief Sketch of the Natural History, &c., of North, Middle, and South Huon Islands, by Dr. McDonald, Assistant Surgeon of H. M. Steam Vessel Torch.

The basis of these islands appears to consist of a coarse grained yellowish brown sandstone and superimposed coral beds, on which broken shells, fine sand, and heterogeneous matters, continually accumulating, have formed the nidus for a scanty vegetation. The great profusion of small masses of pumice stone sufficiently indicates the elevating cause; which, however, must have been very gradual in its operation. On North Huon Island especially the vegetation is exceedingly poor. The few herbaceous plants to be seen are only such as "love a dry, sandy soil," and the spare foliage of the stinted trees scarcely afford any shelter to the young of the fish-hawk, booby, and noddy, whose rudimentary nests, composed of a few dead leaves matted together, are generally fixed on well selected branches. The masked gannet, scorning even this incipient approach to the exquisitely constructed dwelling of the land birds, brings forth its downy and trembling offsprings on the open sand flat, alike exposed to the sweeping storm and potent rays of the tropical sun. This species was found plentiful on Howe Island as well as Norfolk Island, but specimens are rare in European collections of ornithology.

The fish-hawks, or frigate birds, and noddies, take up their abode a little way in the bush, and a handsome cream-colored gannet, with a bluish beak and red feet, perches on the trees near the beach, which is lined by an innumerable host of sea-swallows in every stage of growth.

During our stay we had rather extensive practice in turtle turning; these animals coming up in considerable numbers to reconnoitre the ground for depositing their eggs.

Middle Huon Island, on which we found the crew of the Ningpo, presents a striking contrast, in the character of its soil and vegetation, to the sterile monotony of the former. The brown mould covering the coral beds

is about two feet in depth, and so burrowed and undermined by mutton-birds, which do not frequent the Northern Island, that it is quite impossible to walk through the bush without stumbling continually into these pit falls.

In addition to the mutton-bird, the island is visited by the tropic bird, which forms its nest at the roots of trees in sheltered places. But the most interesting of the feathered tribe is a species of landrail (rallus), which Mr. Billings states also occurs on both South Huon and Surprise Islands. On arriving at New Caledonia we found that the bird was well known there; but how it could have found its way so far to the northward with wings so ill adapted for flight, is not easily accounted for. The fishes seen were sharks of large size, numbers of the wrasse family, the mackerel family, the eel-like fishes, large sucker fishes, and a great variety of brilliantly tinted species —and in particular the little Emperor of Japan—sporting among irridescent patches of living coral on the reefs. Of the botanical orders represented in Middle and South Huon Islands the more important are *leguminosœ*, *goodeniacœ*, *malvacœ*, *capparidaccœ* and *compositœ*.

ADDRESS TO MASTERS OF VESSELS.

WE give place to the following abstract from Proceedings of Convention of Lake Underwriters, held at Buffalo, January 8th, 1856:

The Convention of Lake Underwriters assembled in Buffalo, in January, 1856, offer the following address to Masters of Vessels, advising the Master's duty after his vessel is stranded.

The first duty is to secure the sails, running rigging, and other moveables, keeping them on board if possible, and if not, removing them to the best place of safety on shore, so as to avoid injury as far as practicable, If the Master, after a close examination of his vessel, is satisfied that she cannot be got off the beach by the services of his crew, he must then seek assistance elsewhere.

As a general rule, the Master should not leave his vessel, but having an intelligent mate or other seaman, should send him to the nearest place where he can procure such assistance as may be needed, to get the vessel afloat. The person sent should make a definite contract with the person he employs, as to the price he is to give by the day, or by the job, for the men and the materials to be used. When at this place, send information by telegraph or mail, to the owners, and if the insurers are known, also to them, telling where the vessel is ashore, her condition, and what is doing to get her off.

When materials and men can be had to get the vessel off, go to work immediately, and do not wait the arrival of an agent of the underwriters, because it is the duty of the Master, by the terms of the policy of insurance, to make all the exertions in his power to save his vessel and cargo, and any

neglect to do so, makes the owner responsible for all damage that could be avoided.

If the danger of losing the cargo, or having it badly damaged, is not likely to occur from the condition of the vessel, the season of the year, and the place of stranding, and there is no reasonable probability that the vessel can be promptly got off, send to the nearest available place, to hire another vessel on the best terms you can, and send the cargo to its destination.

If it is necessary to land the cargo for its safety, or to relieve the vessel, do so without delay, making such preparations for its security from damage, as the place will admit—do not permit the whole cargo to be lost, from the fear that a part of it may be, by removal from the vessel.

After the vessel is got afloat, should she be so injured in hull, rigging, or sails, as to make the navigating her dangerous, proceed to the nearest port where repairs can be made, or supplies sent to her. If it is an expensive place, do no more work than is needed to make your vessel seaworthy, and finish your repairs at a more suitable place. Before making any repairs, select three suitable persons, to be placed under oath by a Notary Publicor Magistrate, to make a careful survey of the vessel, and they must specify, in as much detail as possible, the repairs and outfit which are to be made, and which are to be exclusively confined to the damage done by the gale and the stranding. If you are a stranger in the place, seek the advice of the most experienced marine underwriter, or Inspector of the Association of underwriters there, as to whom you shall employ to make the repairs. Examine carefully all the bills for repairs, so that you can explain them to your owner or insurer. When the Master and two others can be spared from the vessel, because their services for the time are not absolutely needed, then go to a Notary or Magistrate, and enter the protest, detailing particularly the cause of the disaster. A protest will not protect the owner from any liability to the underwriters or owners of cargo, which arises from the unseaworthiness of the vessel, or negligence in duty of the master and seamen of the vessel. A master who neglects his duty to the vessel and cargo immediately after disaster, that he may hurry off to a Notary to enter protest, does a very discreditable act, and is justly blameable by the owners and underwriters.

GENERAL REMARKS.

We call your attention to the following copy of the law regulating the carrying of lights, which you should observe, to aid in avoiding collision.

ACT OF MARCH 3, 1849.

Chap. 105, *Sec.* 5.

"*And be it further enacted*, That vessels, steamboats, and propellers, navigating the Northern and Western lakes, shall, from and after the thirtieth day of April next, comply with the following regulations, for the security of life and property, to wit: during the night, vessels on the starboard tack shall show a red light, vessels on the larboard tack a green light, and vessels going off large, or before the wind, or at anchor, a white light; steamboats and propellers shall carry at the stem, or as far forward as possible, a triangular light, at an angle of about sixty degrees with the horizon, and on the starboard side a light shaded green, and on the larboard side red; said lights

shall be furnished with reflectors, etc., complete, and of a size to insure a good and sufficient light; and if loss or damage shall occur, the owner or owners of the vessel, steamboat, or propeller, neglecting to comply with these regulations, shall be liable to the injured party for all loss or damage resulting from such neglect; and the owner or owners of any vessel failing to comply with said regulations shall forfeit a penalty of one hundred dollars, which may be recovered in an action of debt, to be brought by the District Attorney of the United States, in the name of the United States, in any court of competent jurisdiction.

"Approved March 3, 1849."

In the use of these signal lights, it is recommended for general adoption onthe lakes, to carry the colored light when by the wind, and until you get the wind abeam, and then change and carry the bright light.

As there is diversity of opinion among Masters on the lakes, as to the meaning of the terms "starboard tack" and "larboard tack," you will find by reference to the work of the celebrated Nathaniel Bowditch, defining "sea terms," that the vessel is on the "starboard tack" when the wind blows on the starboard side, and this applies alike to square-rigged and fore and aft vessels.

It is strongly recommended that the use of shipping articles be rigidly adhered to, as much of the trouble with seamen in times of disaster arises from the want of legal control over them. (See Acts of Congress for the government and regulation of seamen in merchant service, etc.) Unnecessary losses of hawsers and lines are frequently caused in being washed overboard from not being properly secured by one end being made fast—such losses are not properly claims upon an underwriter. A buoy should be attached to each anchor, with a rope suitable to weigh the anchor. Large expenses would frequently be saved to vessel and cargo, if the masts were so cased that, when broken, a new one could be put in without discharging cargo. A vessel coming into port with a serious leak, should not take in another cargo until a thorough examination of her has been made by competent surveyors, and the necessary repairs made to place her in a seaworthy condition. The practice of many vessel masters leaving their vessel after loading, and joining her at an intermediate port on the voyage, is very reprehensible, and, under some circumstances, will render void the policy of insurance on her and her cargo. For protection in a fog, it is recommended that what is known on the seaboard as a "fog-horn," be used on board.

J. L. WEATHERLY, *President of the Convention.*

The Lake Underwriters have taken a step in the right direction, which appears from a Report of Committee on Registration and Classification of Masters of Vessels.

The Committee to whom was referred the subject of registering the names of vessel masters, respectfully submit that they are of opinion that by far the larger proportion of disasters happen through the incapacity of the master in charge. The great and rapid increase of the tonnage of the lakes has brought into service, as masters, a large number of persons wholly inexperienced, and incompetent for the duties they assume; a fact sufficiently proved by the known character of the last year's losses.

With a view of obtaining such information as may enable Underwriters to more fully understand the true character of risks undertaken, as well as to offer all possible encouragement to deserving and meritorious officers, the Committee recommend a thorough examination into the capacity and character of every vessel-master employed on the Lakes.

They recommend that blank sheets be prepared by the Secretary for the use of the Inspectors, and that he be instructed to ascertain the age, residence, time of service as seamen, mate, and master, whether married or single, vessels commanded heretofore, disasters that have occurred whilst in such command, and habits of life generally of all vessel-masters within their respective beats, with such other facts as may come to their knowledge, as shall truly illustrate the character of each person reported. Such reports to be sent to the Secretary, who shall transcribe the same, alphabetically arranged, in a book prepared for the purpose. Copies of such reports shall be sent to each company forming this Association.

They further recommend that the Executive Committee carefully examine these reports, and select therefrom the names of such persons as shall in their judgment deserve to be placed on record as approved masters; men of integrity, prudent to avoid danger, prompt and energetic when in peril; and, when disaster has happened, faithful to all the interests entrusted to their charge.

A copy of this selected list shall be furnished by the Secretary to each member of this Association. He shall also enter opposite each name selected in the Registry, the word "approved," and address a letter to each person, informing him that this Association have placed his name upon their preferred list of "Approved Masters," where it will remain so long as he continues to sustain the character now accorded him.

Respectfully submitted,

L. W. Weeks, *Chairman.*

RULES

To be observed by Pilots in regard to Steamers' Lights, to prevent Collisions at Night.

In addition to the rules and regulation for the government of Pilots, passed by the Board of Supervising Inspectors, October 29, 1852, the following in regard to lights to prevent collisions at night shall be observed by the Pilots of steamers navigating seas, gulfs, lakes, bays, and rivers, (excepting rivers emptying into the Gulf of Mexico and their tributaries.)

RULE EIGHTH.

Steamers' Lights, to prevent collision at night.

When Under Way.—A bright white light at the foremast head on all steamers having foremasts, and upon the stem or flag-staff at the stem of all steamers not rigged for carrying sail. Green light on the starboard side. Red light on the port side.

When at Anchor.—A bright white light at least twenty feet above the surface of water. The lantern so constructed and placed as to show a good light all round the horizon.

1.—The mast-head or stem light to be visible at a distance at *least five miles* in a clear, dark night, and the lantern to be so constructed as to show a uniform and unbroken light over an arc of the horizon of 20 points of the compass, viz., from right ahead to two points abaft the beam on each side of ship.

2.—The colored side lights to be visible at a distance of at *least two miles* in a clear, dark night, and the lanterns to be so constructed as to show a uniform and unbroken light over an arc of the horizon of 10 points of the compass, viz., from right ahead to two points abaft the beam on their respective sides.

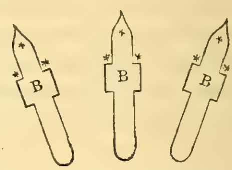
3.—The side-lights to be moreover fitted with inboard screens at least 3 feet long, to prevent them from being seen across the bow. The screens to be placed in a fore and aft line with the inner edge on the side lights.

DIAGRAMS.

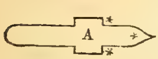
The following Diagrams are intended to illustrate the working of the preceding Plan:

First Situation.—In this situation the Steamer A will only see the *Red Light* of the Vessel B, in whichsoever of the three positions the latter may happen to be, because the *green* light will be hid from view. A will be assured that the *larboard side* of B is toward him, and that the latter is therefore crossing the bows of A *in some direction to Port.*

A will therefore (if so close as to fear collision) *port* his helm with confidence and pass clear. On the other hand, the vessel B, in either of the three positions, will see the *red*, *green*, and *mast-head* lights of A, which will appear in a triangular form, by which the former will know that a steamer is approaching *directly* towards him—B will act accordingly.

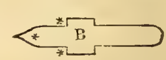


It is scarcely necessary to remark, that the *mast-head or stem light* will always be visible in every situation till abaft the beam.

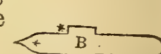


Second Situation.—Here A will see B's *green* light only, which will clearly indicate to the former that B is crossing to starboard. Again A's *three* lights being visible to B, will apprise the latter that a steamer is steering *directly* towards him.

Third Situation.—A and B will see each other's *red* light only. The screens preventing the *green* lights being seen. Both vessels are evidently passing to *Port.*

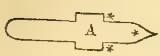


Fourth Situation.—Here a *green* light only will be visible to each; the screens preventing the *red* lights being seen. They are therefore passing to *starboard.*



FIFTH SITUATION.—This is a situation requiring caution—the *red* light in view to A, and *green* to B, will inform both that they are approaching each other in an oblique direction. A should put his helm to port, according to the standing rule mentioned in the next situation.

SIXTH SITUATION.—Here the two colored lights, visible to each, will indicate their *direct* approach towards each other. In this situation it ought to be a *Standing Rule* that both should put their helm to *Port.* This rule is already generally adopted; but it would add to safety if it were made *imperative*, for it is evident, that without some rule of this kind, well understood and practiced, it will be impossible to guard at all times against accident in the situation of the two vessels here given.



The manner of fixing the colored lights should be particularly attended to. They will require to be fitted, each, with a *screen* of wood or canvas on the *inboard* side, in order to prevent *both* being seen at the same moment from any direction but that of *right-a-head.*

This is important, for without the *screens* any plan of bow-lights would be ineffectual as a means of indicating the *direction of Steering.*

This will be readily understood by a reference to the preceding illustrations, where it will appear evident, that in any situation in which two vessels may approach each other in the dark, the colored lights will instantly indicate to both *the relative course of each*—that is, each will know whether the other is approaching *directly or crossing the bows*, either to *Starboard or Port.*

This intimation is all that is required to enable vessels to pass each other in the darkest night, with almost equal safety as in broad day, and for the want of which so many lamentable accidents have occurred.

(It might prove of infinite service, combined with the above plan of lighting steamers, if all *sailing* vessels were provided with a green and red lantern, to be shown by hand on the starboard or port bow, according to the side on which the vessel might be approaching.)

If at Anchor, all vessels, without distinction, should exhibit a *Bright White Light*, at least 20 feet above the surface of water.

FRENCH LOSSES DURING THE CRIMEAN WAR.—Mr. Augustus Stafford, M. P., recently delivered a lecture on the Crimean campaign at Stamford, and was listened to with great attention, by a large audience. The honourable member, during his discourse, related the following information he had obtained from a French officer, and it had been confirmed indirectly by many persons who had opportunities of ascertaining the same statistics. The French had lost between July, 1854, and July, 1855—slain in battle, left dead on the field, 12,000; died afterwards of wounds received in battle, 7,000; sent home with loss of limb or broken in constitution, 25,000; died of disease, chiefly diarrhœa, cholera, and dysentery, 60,000; total loss, about 105,000, exclusive of all who had been killed or died during the last seven months. But, added his informant, "we do not put this in the newspapers; we only report a loss of 20,000.—*United Service Mag.*

VARIATIONS OF THE COMPASS.

OBSERVATORY, WASHINGTON, April, 19, 1856.

MESSRS. EDITORS:—I forward you a letter from the U. S. Chargé d'Affaires at Stockholm, Sweden, to the Secretary of the Navy, concerning certain changes which have taken place in the variation of the compass, along the coast of Sweden. It is important that navigators should be apprised of these changes. I therefore send them to you for your Magazine.

Respectfully, &c.,
M. F. MAURY.

NOTICE.

[TRANSLATION.]

Notice is hereby given, by the Royal Administration of Naval Affairs (of Sweden), for the guidance and benefit of sea-faring people, that from magnetic observations made in 1852, 1854, and 1855, on the coast of Sweden, from the Norwegian borders to Haparanda, including Gottland and Ocland, the North-Westerly variation of the compass has been found to differ from that deduced from former observations, to the extent stated below, in respect to the charts belonging to the Sea Atlas of Sweden.

In laying course and making land, it is necessary, in using such of the said charts as are published, that due notice be taken of the variation now given.

Swedish Coast Chart.	Division of Coast.	Old Variat'n.	New Variat'n.	Differences.	
A	Norwegian Border to Gothenburg	20°00	14°30′	5°30′	Observed in 1855.
B	Gothenburg to the Sound	19 00	14 30	4 30	
C	The Sound	18 30	13 30	5 00	
c 1	The Sound	18 00	13 20	4 40	
D	Bay of Hans (old edition)	19 00	13 45	5 15	Observed in 1852.
E	Ulklipporna to Krakelurd	15 00	12 30	2 30	
F	Ocland to Landsont	18 00	12 30	5 30	
G	Gottland	15 00	11 30	3 30	
H	Landsont to Oregrund	16 00	10 40	5 20	Observed in 1854.
a	Oregrund to Hudikswall	15 00	10 00	5 00	
b	Iatteholmarne to Cape Iarnus	15 00	10 45	4 15	
c	Cape Iarnus to Gumbodo Bay	14 00	9 00	5 00	
d	Bjurö Klubb to Walröen	16 00	8 00	8 00	

STOCKHOLM, March 1, 1856.

From the London Artizan

PRACTICAL RESULTS OF THE SCREW AS A PROPELLER.

We have felt, in common with almost every practical engineer actively engaged in the fitting and equipment of our *steam marine*, whether for purposes of passenger or other traffic, or for purposes of war, that we have still much to learn respecting the screw, and all the elements of a vessel thoroughly adapted for the screw-propeller.

The varying and often contradictory results which we have noticed in our own experience have led us into the conviction that our data and conclusions are still incomplete. It is very much to be desired that the experience and results of our screw steam marine, at present detached, uncondensed, and incomplete, had some focus to draw them together for the general use of science. Some of our scientific societies should take up this subject, and induce the various steam-shipping companies to register and send them in their results,—the facts relative to the dimensions, form, &c., of the vessels; the particulars of the screw-propeller, engines, boilers, &c.; a registration of all trials, especially where different screws have been tried in the same ship. Such matter would, we doubt not, be cheerfully contributed, and if carefully collated and tabulated, would be of immense service as data for onward progress.

We need hardly remind our engineering readers that the laws of nature are fixed and unalterable; that the best form of a ship, the best position and relative proportions of a screw-propeller for any particular ship, are also to be found only by careful study and observation.

It is, in our opinion, very much to be deplored that there is a greater desire amongst many designers to be known as *original* in their works, when it would be very much more to their credit and reputation to be good copyists.* The true and simple laws of nature cannot be departed from with impunity.

We have often regretted that the published trials of many screw ships in the mercantile navy have been, for some special purposes, got up under the auspices of some new or peculiar patent propeller. We have also seen so much of the *cooked* results at such trials, that there are but few which appear in the newspapers which can be depended on.

We would again remark, that so much depends upon local circumstances, such as the state of the weather, the tide, the management of engines and boilers during the time of trial, that great caution is necessary before coming to dogmatic conclusions.

In our last we advocated the introduction of coarse pitch screws. We find, on looking over our notes, that we have some strong proofs to urge in favor of this theory. We shall, however, in this paper make a few remarks on the best form of the ship's after-body,—that it should be as fine as possible, so as to give a free ingress to a solid column of water for the screw to act on.†

We shall take an example from the table of results of the screw steamships of the Royal Navy, published by the authority of the Admiralty. Our example shall be Her Majesty's screw steam frigate, the *Dauntless*. This vessel was designed and built by Mr. Fincham for a full-powered steam-ship,

* We entirely coincide with this remark in its application to models of vessels, as well as to engineering.—[Eds. Naut. Mag.

† Why don't the editor give us the lines of the *Dauntless* before and after "fining" the aft body? Let us see how "fine" it was &c.—[Eds. Naut. Mag.

at a time when the properties required for a large ship were but dimly appreciated.

Tonnage was originally	1,497 tons.
H. P., nominal	580 "
Immersed midship section	522 sq. ft.
Displacement	2,240 tons.

When she was first tried she was jury-rigged, and ballasted to trim: her speed was only 7,366 knots per hour. With this proportion of power to tonnage and speed, it was very evident that there was some malformation and a great waste of power somewhere. It was then determined to lengthen and fine her after-body. Ten feet were put into the stern. The foremost post in the wake of the screw was, in consequence, very much finer. The results were very surprising. In fact, we think it is one of the best examples which have come under our notice. The following figures will show very clearly the *case* of the *Dauntless* :—

H. M. SCREW STEAM-FRIGATE "DAUNTLESS," 33 GUNS, 580 H. P.

Dimensions, &c.	Before Alterations	After Alterations.
Length between the perpendiculars	218 ft.	218 ft. 1 in.
Breadth, extreme	39 ft. 9 in.	39 ft. 9 in.
Mean draught at the time of trial	16 ft. 4 in.	16 ft. 4 in.
Area of immersed midship section	522 sq. ft.	522 sq. ft.
Displacement at time of trial	2,240 tons.	2,251 tons.
Tonnage, Builders' old measurement	1,497 tons.	1,569 tons.
H. P., nominal	580 "	580 "
H. P., indicated	811 "	1,218 "
Diameter of screw	14 ft. 8 in.	14 ft. 8 in.
Pitch of screw	18 ft.	18 ft.
Length of screw	3 ft.	3 ft.
Revolutions of screw	55·3.	68·28.
Slip of screw, per cent.	24·97.	15·09.
Immersed section to screw's disc	3·09.	3·09.
Indicated H. P. to section	1·55.	2·3.
Screw's pitch to diameter	1·22.	1.22.
Speed per hour	7·366.	10·293.
Revolutions of engines	24·3	·30.

It will be seen by the above table that the broad and striking facts of this case stand thus:—That by lengthening the after-body and reducing the bluff end of the stern immediately before the screw, with the same engines and boilers, the speed of the ship was increased 3 knots, or from 7·3 knots to 10·2 knots per hour: the indicated H. P. raised from 811 to 1,218; the slip reduced from 24 to 15 per cent.; the immersed midship section being the same in both trials, and the displacement only increased 11 tons. The indicated H. P. to section being in the first instance 1·5, in the second trial 2·3.

The professional reader will also be struck, in carefully looking over our table, with the low proportion of indicated H. P. to the nominal H. P. This gives us a chance to fling another stone at the geared engine.

The engines of the *Dauntless* are geared, and made by Mr. R. Napier, of Glasgow. They are strong and substantial, we doubt not; but we can only say that, judging by the results as published in these tables, they are not in the *right* place. Better results can now be obtained with boilers of the same size from a pair of 400 H. P. *direct* engines, with about half the weight of metal to carry.

OUR STATE ROOM.

THE MERRIMAC was at Annapolis on the 17th ult., and honored by a visit from the President, Secretary of the Navy, and several Members of Congress, who expressed high admiration of her strength and beauty.

EAST INDIA SQUADRON.—The United States sloops of war Macedonian and Vandalia were at Hong Kong on the 15th of January—the latter arrived from Amoy on the 13th. Captain Pope had shipped from the Vandalia, to the Macedonia, and the former was under the command of Lieut. Botts, and was about to proceed to Manilla.

THE BALTIC FLEET.—By the latest European intelligence, the Baltic Fleet has ceased to exist, in being transferred to the Home Fleet, under the command-in-chief of Admiral Seymour, the Port Admiral, at Portsmouth.

THE COCKPIT.—The Assistant Surgeons left the Cockpit years ago; at the present time, there is a fight every time a ship—having one—goes to sea, as to whom the rooms belong.

RULES AND REGULATIONS.—Every captain can give what orders he pleases for manœuvres, and can station his crew as he pleases.

There are no internal rules except what each captain makes, and no two in a squadron need have the same.

SIGNAL BOOK.—Our naval signal book is scarcely intelligible.

CONSTRUCTION AND EQUIPMENT.—A landsman directs for the Navy the placing of sail-rooms and store-rooms; selects capstans, chain-stoppers, &c., about which he can know no more than a house-carpenter.

NAVAL INDICATIONS.—In all times there have been symptoms of nations being either seriously weakened or utterly destroyed. Their fall has always been preceded by the loss of their Navy. We may therefore conclude from the lessons of the past, that nations arrive at the highest degree of prosperity, neither by the cultivation of letters, nor the fine arts; but that they may calculate on greatness and importance, when the national honor is protected by a formidable fleet, and commerce is encouraged by a multitude of vessels.

FINE LITHOGRAPHS.—It gives us much pleasure to note the progress of this highly meritorious and pleasing means of acquainting landsmen with the appearance of celebrated ships.

The steamers *Persia* and *Arabia*, and clippers *Dreadnought*, *Flying Cloud*, and *Comet*, whose performances are world-wide, are thus beautifully memorialized; and they will continue to exist on paper and canvas, when a future age will recur to them, as eminent for the times. Published by N. Currier, 152 Nassau-street, N. Y.

NEW BOOKS—Crowded out.

OUR LOG BOOK.

DEATHS.—Commodore Isaac McKeever, U. S. N., at the Navy-Yard, Norfolk, Va., 1st April.

Commander George Adams, at his residence, in Baltimore, on the 19th ultimo.

Lieut. Richard L. Love, U. S. N., near Pensacola, Fa., 7th April.

THE MEDICAL BOARD.—The following named Assistant Surgeons were found qualified for promotion, and advanced to the rank of

Passed Assistant Surgeons: W. F. Carrington, to rank next after P. A. Surgeon, Jno. Ward; James Suddards, next after P. A. Surgeon, F. M. Gunnell; James F. Heustis, next after P. A. Surgeon, Edward Shippen; Arthur Linah, next after P. A. Surgeon, J. F. Heustis; Samuel F. Cowes, next after P. A. Surgeon, A. Lynah; Charles F. Fahs, next after P. A. Surgeon, S. F. Cowes; George Peck, next after P. A. Surgeon, C. F. Fahs; Jenks H. Otis, next after P. A. Surgeon, G. Peck; Frederick Horner, Jr., next after P. A. Surgeon, J. H. Otis.

The following named were found qualified for Assistant Surgeons:

No. 1, H. A. F. Washington, Va. 2, Richard C. Dean, Pa. 3, H. L. Shelton, Ct. 4, Philip S. Wales, Md. 5, Albert C. Gorgas, Pa. 6, Alex. M. Vedder, N. Y. 7. Delavan Bloodgood, N. Y.

ORDERS.—Capt. W. J. McCluney, U. S. N., to command the Norfolk Navy-Yard; but at his own request, on account of recent hard service—*four years in the East-Indies*—relieved, and Commodore E. A. F. Lavalette ordered in his stead, in place of Commodore McKeever, deceased. Lieut. R. B. Lowry to the Receiving-ship Ontario, Baltimore, in place of Lieut. F. S. Conover, detached.

Passed Assistant Surgeon, S. F. Cowes, U. S. N., to the Coast Survey steamer Walker.

To the steamer Hetzel, Coast Survey, Lieuts. John Almy, Commanding, Wm. Gibson and Robert D. Minor; Passed Assistant Surgeon, Randolph F. Mason; Master, Wm. H. Ward; Second Assistant Engineer, Wm. G. Wheeler, and Third Assistant, Jackson McElwell.

To the C. S. Schr. Nautilus: Lieuts. Richard Wainwright, Commanding; J. B. Stewart and D. P. McCorkle.

Steam-Frigate Susquehanna, to fit for the Mediterranean station. The following officers have been ordered: Captain, Joshua R. Sands; Surgeon, Ninian Pinkney; Lieuts. John C. Howell; Paul Shirley.

Commander P. Drayton, detached from ordinance duty, N. Y., on leave.

DISASTERS AT SEA.

STEAMERS.

Leviathan, (tug), of New-York, was burned near Sandy Hook, March 20, crew saved.
Curlew, (Br.), Halifax for Bermuda, sunk near the latter port, March 18, crew saved.
A. B. Chambers, sunk near St. Joseph's, Missouri, March 27, crew saved.
Financier, sunk in the Red River, March —, crew saved.
Osprey, at Kingston, Ja., was burned March 20.
Daniel White, sunk near Golconda, April 14.

SHIPS.

John Bright, at New-York, from Liverpool, lost sails, &c.
Samuel M. Fox, at New-York, from Havre, lost sails, rigging, &c.
Onward, at New-York, from London, lost some sails, &c.
Robert Center, at New-York, from Antwerp, lost sails, spars, &c.
Tigress, Philadelphia for Liverpool, sunk in the Delaware River, March 23.
City of New-York, at Boston, from Liverpool, lost sails, &c.
Benj. Morgan, (whaler), at Hong-Kong, leaking badly.
Cape Cod, Calcutta for Boston, was abandoned in a sinking condition, Dec. 1.
Harvest, at Baltimore, from Liverpool, lost some sails, &c.
Nictaux, (Br.), Troon for St. John, N. B., put into New-York March 22d, lost sails, &c.
Mariner, Liverpool for New-Orleans, went ashore near Key West, March 13.
William Hamilton, (whaler), of New Bedford, was lost near Chili, Jan. 28, crew saved.
Courser, Liverpool for Shanghae, put into Hong-Kong leaky, Jan. 6.
George Hallett, at Boston, from Calcutta, stove bulwarks, &c.
Sea Lion, Charleston for Havre, put into Bermuda, March 17, leaky.
Tonawanda, at Philadelphia, from Liverpool, lost some sails, &c.
John Rutledge, from Liverpool, was totally lost, Feb. 19, 145 lives lost.
Nor-wester, at Boston, from Calcutta, lost jibboom, fore and main-topgallant-masts.
Redgauntlet, at San Francisco, from New-York, much damaged.
Desdemona, Havre, for Cardiff, put into St. Ives, in distress, March 11.
Merrimac, for New Orleans, lost sails, &c.
Panther, Calcutta for London, was seen off Falmouth, E., with loss of jibboom.
Sea-Witch, Amoy for Havana, was totally lost near Havana, March 28, crew saved.
Unknown, was seen on fire, Feb. 24, in lon. 26 35, and lat. 26 10.
Capitol, at Baltimore, from Liverpool, lost sails, &c.
White Star, (Br.), Liverpool for Mobile, went ashore on Mobile Point, March 29.
St. Bernard, Newport, E., for Baltimore, put into Fayal, in distress, prior to February 27.
Mississippi, at New-York, from Rotterdam, lost sails, stove bulwarks, &c.
Underwriter, at New-York, from Liverpool, sprung a leak, lost sails, spars, &c.
Robena, at New-York, from London, lost some sails, &c.
Helena, at San Francisco, from Hong-Kong, lost some sails, stove bulwarks, &c.
Walton, Liverpool for Para, put into Cork, leaking badly, March 12.
Havre, (Fr.), for Havre, put into Bahia, leaking badly.
Suffolk, Boston for London, put back April 13, leaky.
New-Hampshire, Glasgow for New-York, put into Bermuda, March 27, in want of sails.
Frances, Boston for New Orleans, was lost on the Dog Rocks, April —.
Adam Lamont, Nassau, for New Orleans, put back leaky, March 24.
Rising Sun, Mobile for Havre, was seen March 17, water-logged.
Harkaway, Glasgow, at Charleston, in distress, April 10.
Sea Lion, Charleston for Havre, put into Bermuda, leaky, March 16.
Glance, at Baltimore, from Liverpool, lost rudder, March 16.
Boomerang, (Br.), Mobile for Liverpool, was seen March 31st, abandoned and water-logged.
East Indian, Newburyport, for New Orleans, was seen April 12th, much damaged.
Annapolis, at Baltimore, from Liverpool, lost sails, &c.
Fidelia, at New-York, from Liverpool, lost sails, &c.
Abby Langdon, Havre, for Charleston, went ashore at Cape Romain, April 11.
Caroline, at Baltimore, from Liverpool, much damaged.
J. Bradlee, San Francisco, for New-York, put in at Port Stanley, in distress.
Arcola, at Philadelphia, from Palermo, lost sails, &c.

BARQUES.

Western Sea, at Boston, from Palermo, with loss of some sails, jibboom, &c.
Justice Storey, at Boston, from Baltimore, with loss of main and mizzenmasts.
Mary, (Br.), Yarmouth, for Doboy, Ga., put into Savannah, leaking badly, March 16.
Carlo Mauran, at New-York, from Stockholm, was much damaged, March 14.

Brothers, at New-York, from Newcastle, Eng., lost sails, spars, &c.
Fifth of May, (Prus.), New-York, from Newcastle, E., is much damaged.
J. Forbes, Guayama, for Newhaven, abandoned in a sinking condition, March 20th, crew saved.
Mary Morris, at New-York, from Glasgow, lost sails, &c.
M. L. Frank, Matanzas, for New-York, put into Savannah, March 20th, in distress.
Bee, (Br.), of Liverpool, was abandoned in a sinking condition, Jan. 21st, crew saved.
Petrus, Gottenberg, for Boston, was abandoned in a sinking condition, March 12, and crew saved.
Voyager, at Boston, from Palermo, lost sails, jibboom, &c.
Leo, at New-York, from Havana, lost some sails and foremast.
Romulus (Br.), St. John, N. B., for Bristol, Eng., abandoned in a sinking condition, Feb. 26.
Barclay, (whaler), was wrecked off the island of Cuba, March 18, crew saved.
Robert Pennell, at New Bedford, from Philadelphia, in contact with an unknown schooner, March 30, is much damaged.
Roman, Buenos Ayres, for Southampton, Eng., put into Montevideo, leaky, Feb. 3.
Kepler, at Toulon, from New-York, sprung aleak, Feb. —.
Brunette, at New-York, from Havana, lost sails, bulwarks, &c.
F. Palmer, at San Francisco, from Honolulu, lost some sails, March 23.
Ottawa, for Havana, was seen March —, dismasted.
Queen Victoria, (Br.), Savannah, for Liverpool, was seen April 5th, water-logged and abandoned.
Katharine, (Br.), Cardiff, for New-York, was seen April 4, leaky.
Corrilla, for New-Orleans, was seen April 5, leaky.
C. E. Lex, at Philadelphia, from Port-au-Prince, lost part of deck-load, &c.
Ocean Gem, (Br.), Jamaica, for London, put into New-York, in distress, April 9.
E. P. Mowe, Palermo, for Boston, lost topgallant-mast, March 11.
Pentucket, Guayama, for New-York, was seen putting into Baltimore dismasted, and in distress, April 11.
Convoy, New-York, put into Key West, in distress, April 5.
Washington W. Batcher, Philadelphia for New-Orleans, was seen dismasted, March 26.
F. Lenning, at New Orleans, for Philadelphia, sprung aleak, March 27.
Eastern Belle, at Boston, from Newcastle, Eng., lost sails, jibboom, &c.
Mary Varney, Norfolk, for Guadaloupe, was abandoned in a sinking condition, April 7.
Archimedes, Shields for Boston, was abandoned in a sinking condition. March —.
Jan Van Schaffelaur, at San Francisco, from Cardiff, lost spars, &c.
Sarah Park, at Philadelphia, from Liverpool, was much damaged.

BRIGS.

Titania, at Boston, from Havana, lost bowsprit.
Artemas, (Br.), Havana, for St. John's, N. B., put into Charleston, in distress, March 17.
Mary Ann, Georgetown, S. C., for Boston, was abandoned March 13, crew saved.
Cardiff, Aux Cayes for New-York, went ashore on Corson Inlet, N. J., March 19.
Horatio, Key West for Providence, put into Norfolk with loss of sails and leaky, March 22.
Free Trader, (Br.), was lost on the coast of Placentia Bay, N. F., crew lost, Feb. —.
Wm. Grafton, Porto Rico, was seen March 14, with loss of masts, deck-load, &c.
Emeline, New-York for Constantinople, was abandoned in a sinking condition, Feb. 11.
Tornado, at New-York, from Rio-Grande, lost some sails, &c.
S. G. Adams, at New-York, from Rio Janeiro, lost sails, &c.
Fannie, at New-York, from Cienfuegos, lost sails, &c.
Delta, at New-York, from Porto Rico, lost deck-load, stove bulwarks, &c., March 14.
Molunkus, at Philadelphia, from Porto Rico, lost sails, &c.
Twilight, at Baltimore, from Attakapas, lost sails, topgallant-mast, deck-load, and leaks badly.
Clement, Baltimore, for Boston, went ashore in Narragansett Bay, March 25.
William Crawford, at Norfolk, from Ponce, with loss of sails, masts, and leaky.
Wetumpka, New-York, for Mobile, put back leaky.
Auburn, (Br.), Cardenas, for Portland, put into St. John, N. B., much damaged, March 15.
Eagle, Trinidad for Boston, put into Key West March 19, leaking badly.
Francis, (Br.), at New-York, for St. Domingo City, leaks badly.
Vermont, Baltimore for Cork, put into Norfolk March 30, leaky.
St. Leon, Gonaives for Boston, was abandoned in a sinking condition, March 28.
Stephen Young, at Baltimore, from Attakapas, lost deck-load, March 24.
Principe, Darien, Ga., for Havre, put into Bermuda, in distress, March 17.
Argo, Wilmington, N. C., for Washington, D. C., put into Charleston, leaky, &c., April 3.
R. W. Packer, at Boston, from Cape Haytien, lost part of deck-load, March 25.
Lagrange, (herm.), for London, put into Queenstown, leaky, &c.
Motto, Darien, Ga., for Boston, was abandoned in a sinking condition, March 28.
Charles Miller, at New-York, from Attakapas, sprung aleak March 27.
E. Baldwin, Cardenas for Boston, put into Holmes' Hole, March 31, much damaged.
New Era, at Philadelphia, from Messina, lost jibboom, topgallant-mast, sails, rigging, &c., March 29.

Abrasia, Darien, for Barcelona, put into Bermuda leaking badly, March 28.
Billow, (Br.), at Boston, from Palermo, lost some sails, stove bulwarks, &c.
Bermuda, Demerara for England, foundered at sea, crew saved.
Alliance, (Br.), at New-York, from Newcastle, Eng., lost sails, bulwarks, &c.
Johanne, Emilie, (Prus.), at New-York, from Bordeaux, lost some sails, stove bulwarks, &c.
George Lohse, Baltimore for Kingston, Ja., put into Charleston, in distress, April 11.
Jenny Lind, Satilla River, Ga., for a northern port, put into Charleston, leaky, April 11.
Susan Small, New-York for Jacksonville, put into Philadelphia much damaged, April 14.
Free State, at New-York, from Rochelle, lost sails, &c.

SCHOONERS.

Matilda, at Charleston, for Attakapas, lost some sails, &c., March 13.
A. F. Howe, Portland, Me., for Norfolk, lost sails, &c.
W. W. Brainard, Matagorda, for New-York, put into Charleston, March 16, much damaged.
N. Stetson, at Philadelphia, from Pernambuco, lost masts, jibs, &c.
Francis Newton, at New-York, from Pensacola, lost sails, &c.
C. Perkins, from St. Thomas, put into Nassau much damaged, March 21.
Mountain Spring was totally lost Jan. 7, crew lost.
Oregon, Bath for James River, put into Norfolk, much damaged, March 14.
John B. Moreau, Virginia for New-York, was lost near Little Egg Harbor, March 21.
Harriet, Aux Cayes for Boston, put into Holmes' Hole, leaky, March 25.
Silver Cloud, Mongee Island for Philadelphia, put into Norfolk March 23, very leaky.
W. H. Gatzmer, Bucksville, S. C., for Charleston, sank near latter port, March 23.
Charles Hill, Boston, for Monk's Island, put into St. Thomas, Feb. 28, leaky.
Kensington, Mexico for New-York, was seen going to St. Thomas in distress.
Ella, at Philadelphia, from Manatitlan, Mex., with loss of sails, &c.
Martha, Florida for Texas, was wrecked near Tamhalier Island, crew lost.
Unknown, was seen March 6th, abandoned, and with mainmast gone.
S. D. Norton, was seen March 15, with masts gone, and abandoned.
H. M. Jenkins, Georgetown, S. C., for Portsmouth, put into Holmes' Hole, in distress, March 26.
Eliza Ann, Jacksonville for Boston, was abandoned in a sinking condition, Feb. 22.
Ellen Dyer, New-York for Remedios, was abandoned in a complete wreck, March 4.
Irene, Rockport, Me., for Norfolk, put into Boston March 28, leaky, &c.
Sarah Seavey, Portland for Potomac River. was abandoned in a sinking condition.
J. M Warren, New-York, was totally lost near Norfolk, March 30.
Tempter, Charleston for Providence, was burnt March 25, crew saved.
Hester A. Jones, Grenada for New-York, ran ashore off Corn Island, March 12, total loss.
J. H. Counce, Rockport, Me., for Charleston, put into Boston leaky, March 26th.
Gulf Stream, Mobile, for New-York, went near Cape Fear, April 3, much damaged.
North Point, at New-York, from Rio Janeiro, lost sails, bulwarks, &c.
Louisine, Savannah, for New-York, was burnt March —, crew saved.
Roan, Gonaives, for New-York, put into Wilmington, N. C., in distress, April 4.
Ophir, Norfolk for Portland, was abandoned in a sinking condition, March 30.
Golden Rod, a' Philadelphia from Mobile, lost some sails, &c.
Mary C. Ames, at Nantucket, sunk April 4th.
Woodbine, Attakapas, for Richmond, put into Wilmington, N. C., April 2, much damaged.
S. Hitchkiss, at Charleston, from Boston, lost some sails, &c.
Wescogus, Darien, from New-York, abandoned in a wrecking state, March 29.
Martha Burgess, for Martinique, abandoned in a wrecking state, March 27.
D. W. Dixon, Harwich, for New-York, went ashore on Bateman's Beach, April 3, total loss.
Sidney Minor, Philadelphia for Boston, ran into steamer Roanoke and sunk, April 5, crew saved.
Rush, at Charleston, from Attakapas, lost some sails, &c.
Z. Snow, at Boston, from Aux Cayes, lost deck-load, March 20.
Union, at Charleston, from Havana, lost deck-load.
Republic, Baltimore, for St. Lucia, put into Bermuda, in distress, April —.
Lorely, (Dutch), New-York, for Amsterdam, was seen March 15, putting back in distress.
C. A. Libby, N. Y., for Vera Cruz, was totally lost on the Alcrane Reef, March —.
Unknown, was passed April 4, water-logged and abandoned.
Emerald, was totally lost in Caribbean Sea, March —, crew saved.
W. C. Atwater, Newhaven, for Porto Rico, put into St. Thomas much damaged, March 22.
Martello, (Br.), St. John's, N. F., for Baltimore, was abandoned in a sinking condition, &c., April 10.
Unknown, was seen April 9, abandoned in complete wreck.
N. D. Norton, was seen in lat. 31 26 N., lon. 68 48 W., April 9, sunk.
Thomas Bradley, at New-York, from San Juan, Ky., lost some sails, &c.

NOTICES TO MARINERS.

SAILING DIRECTIONS FOR THE NAVIGATION OF THE YANG-TSZE-KIANG TO WUSUNG AND SHANGHAE.

Prepared by Lieut. Preble, U. S. N., by order of Commodore Joel Abbot, Commander in Chief of the United States Naval Forces in the India and China Seas, &c., &c.

Vessels bound to Shanghai, from the West Coast of America or the Pacific, and all who are unacquainted with the navigation of the Chinese coast, are recommended in the northerly monsoon to make the Saddle group of islands, as being the most weatherly land fall.

During the southwest monsoon, for the same reason, they are advised to steer for the high, dome-shaped island of Video, called by the Chinese Wong-shing-shan, which is the highest island to the southward, and in a clear day can be seen fifty or sixty miles. This island has a bold, precipitous appearance, and is nearly square. It has also a remarkable white cliff, which, near to, shows distinctly, when the island bears N W. by N. The summit of Video is in latitude 30 deg. 8 min. N, lon. 122 deg., 46 min. east of Greenwich.

N. 74 deg. E. from Video, and 5 miles distant, are seven rocks called the "Four Sisters;" and N. 78 deg. E. nine miles, are two rocks called the "Brothers." Between these rocks and Video, and between the two groups of rocks themselves, there are safe passages, the depths varying from thirty to forty fathoms.

N. 24 deg. E., and 19¾ miles from Video, is "Leconna," which appears, when seen from the south at that distance, three abrupt and round-top hummocks.

N. 17 deg. W., 14½ miles from Video, is the "Beehive Rock," 35 feet high, with a rock-awash three cables to the eastward of it; otherwise, the depth of water around it is from 14 to 17 fathoms.

Between Leuconna and the East Saddle is "Childer's Rock," which is a rock-awash, and which does not always show. When on it, the peak of E. Saddle bears N. 9 deg. W., the Barren Islands N. 70 deg. E., and Leuconna S. 15 deg. E. The lead gives no warning of it, the depth being 24 fathoms close to. This is the only hidden danger in the passage up to and beyond the Saddles. It is, therefore, needless to mention the appearance of any of the other land beyond and to the westward, the charts being a sufficient guide.

The Saddle Islands form the northern boundary of the Chusan Archipelago, and comprise a group of five large islands, called "North," "South," "East," "False," and "Side" Saddles, with numerous smaller islets and rocks included between the lat. of 30 deg. 40 min. and 30 deg. 50 min. N., and long. 122 deg. 35 min. and 122 deg. 49 min. E. The two largest of the group are saddle-shaped, about eight hundred feet high, and of similar appearance when seen from the eastward. The northernmost point of the North Saddle Island is in lat. 30 deg. 50 min. N., and its easternmost point in long. 124 deg. 14 min. E.

East by south from the North Saddle, and to the eastward of the East Saddle, in lat. 30 deg. 43 min. north, long. 123 deg. 9 min. east, are the Barren Islands, which are three rocks about 50 feet high, nearly east and west from each other. To the southeastward of the eastern rock is a rock-awash, distant from it about two cables. In some of the former directions, navigators have been recommended to make these islands, probably as a caution in coming from the eastward, as they are the most eastern rocks on the Chinese coast belonging to China.

Leaving the Saddle Islands, keep the North Saddle bearing about S. E. by E., and bring Gutzlaff Island to bear south about fifteen or sixteen miles distance, when the Amherst Rocks, if in sight, will bear N. E. ½ E. twelve miles.

Gutzlaff Island is 210 feet high, and in a clear day can be seen twenty-seven miles. It appears a small round lump, and has a small rock or islet off its northeastern point. It is to be hoped that at no very distant day a lighthouse will be established on this island, which, standing as it does in the gateway to the Yang-tsze-kiang, affords the best possible position for one. The light should be a first-class light, of the flashing or revolving kind, which can be seen thirty miles or more.

As the island is more than high enough, a tower of sufficient size to contain the lighting apparatus and keeper's dwelling would only be required; its cost, therefore, would be inconsiderable. The yearly expense for keeping would be much less than what is required for keeping up the lightship, for which a beacon of some kind might then be substituted.

The Amherst Rocks are a small cluster of ragged rocks, of which one is larger than the rest, and elevated twenty feet above low water. Including the surrounding reef, they occupy an area of half a mile in extent, and mark the easternmost extent of the north banks. In the old sailing directions, it was recommended to make them; but it is now considered best, for reasons which are obvious, to make Gutzlaff as above. It may be well here to remark, that no vessel should attempt to pass up the river, without first sighting Gutzlaff or the light vessel. The Amherst Rocks are in lat. 31 deg. 09 min. 03 sec. N., lon. 122 deg. 24 min. 06 sec. E., and bear from the North Saddle N. 42 deg. E., distance 24 miles.

W. 14 deg. S. from the Amherst Rocks are the Ariadne Rocks, on which several vessels have

struck. These are all under water and seldom seen, and therefore to be avoided. In heavy weather the sea is said to break on them ; but several of the most experienced pilots say they have never seen them.

North of the Ariadne Rocks, about sixteen miles, and about N. by W. from the Amhersts, is the Island of Shaweishan, about the size or a little larger than Gutzlaff, and one hundred and ninety-six feet high. It is not often seen when a ship is in the right position for approaching the north bank. Vessels approaching the river are therefore cautioned, that, when it shows plainer than Gutzlaff, (which is the same height), they are too far to the northward, and in danger of entering the false channel to the northward of the north bank.

After bringing Gutzlaff on the before-mentioned distance and bearing, if a clear day, the light-ship under the north bank will be seen ; when steer for her as before directed, and pass her at any convenient distance, leaving her on your starboard hand. If working in, be careful not to bring the light-ship to bear to the westward ; W. by N., if in a ship of large draft ; or to the southward of west, if in a small vessel ; as the bank shoals suddenly from four or five fathoms to two, according to position, and the Ariadne Rocks bear east 11 deg. S. from light-ship, 13 miles distant.

Using this caution, you may, when up with, pass the light-house close to, as most convenient ; though strangers are not commended to go inside of her. Thence steer W. N. W., until you sight the beacon erected on the south shore at the " Three Trees." When the south shore beacon or the "Three Trees" bears about W. S. W., your ship will be in six fathoms at low water, and the south shore will be plain in sight.

Continue now a N. W. by W. course, and pass the south shore beacon at two or more miles distance, when you will in all probability see the dry north bank on your starboard hand, which is only covered at the highest spring tides. You will soon rise " Block House Island," which at first has the appearance of a cluster of fishing-boats, gradually showing itself a low island covered with bushy trees. When the large house on this island bears N. E. by E., you are in the narrowest part of the channel, which at that point is only one mile and a quarter wide. After passing Block House on the starboard hand, you should gradually close with the south shore to about a mile, and keep it at that distance until the marks and buoys for Wusungspit are seen. As the south shore bank is steep to, that shore should not be approached nearer than three quarters of a mile. The second clump of large bushy trees on the low open point, half a point of the square and well-defined outer Point of Paushan, will clear you of the Wusung South Spit, if the buoy at any time be removed.

The foregoing directions apply to vessels of a heavy draft, say 18 feet. Small craft may use much more freedom, closing with the south bank when Gutzlaff is 12 or 15 miles to the southward, and working up with the lead for a guide. The southern shore is not to be depended on all the way, however, as after passing the Beacon the bank is very steep, and should not be approached within three quarters of a mile.

After passing Wusung Marks, keep the western shore well on board until after passing Wusung village, and up to the first point on the eastern side, or until you open the second creek on the eastern shore, which will be about a mile above the village. Then cross over and keep the eastern shore close on board until up to the head of this reach, where a fleet of junks is usually moored opposite a village ; which course will also take you over the bar above Wusung, the channel over which bar in some places is scarcely a cable wide. Through the next reach the course is nearly south, and keep in mid-channel. When up with Half-way Point, close with the eastern bank again, and keep it close on board until the foreign settlement of Shanghae is in sight ; when cross over, and keep nearest to the right or western shore.

The depth of water on the outer bar at the lowest spring tides is twenty-one feet, and on the bar above Wusung it is about twelve feet. The greatest draught of water ever brought up to Shanghai has been between twenty-one and twenty-two feet ; and a ship drawing that much water will have to wait for the spring-tides, to pass up or down the Wusung river.

In working up, after passing the light-ship, you should not, in standing towards the north bank, bring her to bear to the southward of S. E. by E. ½ E. and on the south bank side, should go about when in 3½ fathoms water.

The deepest water is near and along the south edge of the north bank. Generally, the inner edge of the north bank is lined with heavy fishing stakes close to, which are planted in four and five fathoms of water. A ship's length inside of them there is but a few feet of water.

It will be generally safe for a vessel to anchor off the entrance of the river, outside of Gutzlaff in four, five, or six fathoms of water ; and I would not recommend an anchorage being sought under the islands at night, unless there are appearances of bad weather, as it will frequently take all the daylight of the next day to work up from the islands.

In the summer time, if bad weather is approaching, which the barometer will usually foretell, an anchorage should be sought under the islands, or the vessel kept to sea, as it is dangerous to enter the river when a gale is coming on, without a prospect of getting in. It is, I think, preferable to anchor rather than stand to sea, as the weather is sometimes thick or foggy ; the tides are strong and uncertain, and the ship's position may be lost.

All the compass courses given in these directions are to be varied, according to the stages and strength of the tides. The use of a ground log for both course and distance is therefore recommended, the ship's course being materially affected both by the strength and set of the tide.

It is high water at the full and change of the moon in the neighborhood and to the eastward o Gutzlaff, between 11 and 12 o'clock.

In the river off Wusung, high water occurs at the full and change about 1 hour 30 minutes. The rise is uncertain, but ranges from one fathom to fifteen feet. Its velocity is from 1¾ to 4½ knots, but it is affected both in velocity and direction by the prevailing wind.

From the Saddle Islands to Wusung, the tide generally sets N. W. by W. and S. E. by E., when fully made, if no such cause as N. E. gales or heavy rains interfere. The flood makes first to the southward, then S. W., and gradually round to N. W. at half flood, which is its direction at the strength of the tide.

The first of the ebb sets to the northward over the north bank, and in like manner changes round to the eastward, gradually running the strongest with S. E.

It is at the turn of both tides that most caution is necessary, to avoid being set out of the channel. Round the S. E. edges of the south bank the flood sets W. S. W., and the ebb the contrary way. Leaving the position off Gutzlaff at a quarter ebb, a vessel will carry the flood to Wusung, if there is any wind.

By a meteorological register kept at Shanghai, the prevailing winds for the last seven years appears to have been, in

January, N. E. to N. N. W., and generally N. N. W.
February, N. E. to N. W., and generally N. W.
March, N. E. to S. E., and variable.
April, E. N. E. to S. E., chiefly S. S. E., and variable.
May, E. S. E., to S. S. E.
June, S. E. to S. S. E.
July and August, S. S. E.
September, N. E. to E.
October, N. E. to N. W.
November, N. W., and variable.
December, N. to N. W.

The temperature by day and night, taken by a self-registering Fahrenheit's thermometer, in the open air in the shade, at Shanghai, from 1848 to 1854, gives the following as the extreme ranges, and the average mean temperature of each of the months, for those seven years :

	Maximum by Day.	Minimum by Night.	Average Monthly Mean.
January	67	18	41
February	65	19	42
March	75	28	50
April	79	33	59
May	87	37	69
June	99	58	75
July	100	64	85
August	100	63	84½
September	92	51	77½
October	90	37	67
November	80	25	56
December	77	19	46

The mean average height of the barometer in the spring and winter months is above 30 inches, and in the summer months below it, viz. :—For January to April, inch. 30.25 ; from October to December, inch. 30 34 ;from May to December, inch. 29.83, ranging lowest with southerly winds and during the N. E. monsoon season.

January is generally fine. In February thick fogs occur. March is damp and disagreeable. April has more rainy days than any other month, except June, which is the wettest month. In May there is but little rain, and that little occurs in heavy showers. July is hot, dry, scorching, with considerable rain in the form of evening thunder showers. July and August are the hottest months. In September the S. W. monsoon is wholly broken up, and the temperature is very changeable. In November the winter fairly sets in, the first frost appearing from the 12th to the 20th. December is the driest month of the year, and the weather clear and freezing, though fogs are of occasional occurrence. In May, June, and July, fogs also occur.

The summer gales are strongest from the S. E., and generally give good notice, the barometer beginning to fall sometimes as much as 24 hours previous. The rules for judging the barometer on the Chinese coast generally hold good for the neighborhood of Shanghai. A rapid fall of the barometer betokens a gale, and a high range the continuance of northerly winds.

Captains can deposit their chronometers and have them rated by transits, at the observatory of Messrs. Kupfertchmid & Dafo, Shanghai. Their observatory in Church-street is in lat. 31 deg. 14 min. 8.9 sec. N., lon. 8 hrs. 6 min. and 2 sec. east of Greenwich.

Competent foreign pilots (English and American) will be found cruising in the neighborhood of the Saddle Islands during the summer months, and the entrance of the river outside of Gutzlaff in the winter. No sailing directions can do away with their usefulness to the stranger, where the

safety of the ship depends so much upon a correct knowledge of the tides. The signal of the authorized pilots is a flag half white and red horizontal, with the number of the boat in black.

Agreeably to an order from Commodore Joel Abbott, Commander-in-Chief of the United States naval forces in the East India and China Seas, &c., &c., to me directed, under date July 25, 1855, to co-operate with you in carrying out an agreement entered into between yourself and his Excellency Chaon, with reference to the marking and buoying the Yang-tse-Kiang, dated July 21, 1855, I have the honor to report that the following marks, &c., for improving the navigation of the Yang-tse-kiang up to Wusung, have been decided upon, and are now being placed and erected at the expense of the Chinese authorities.

First—A light vessel of one hundred and thirty tons burthen has been moored with heavy chains and anchor, in four fathoms of water at low-water spring tides, near the south-western extremity of the south-eastern part of the North Tungsha Banks. This vessel is placed in latitude by observation 31 deg. 09 min. 15 sec. N. longitude by the mean of several observations by the three chronometers of the United States ship Macedonian, 121 deg. 59 min. E. ; and bears by compass from the centre of Gutzlaff N. N. W., from which she is distant twenty-five miles. This position places her on the inner edge of the outer bar marked on Collinson's chart of the river, and well up towards the north bank. In working in, she should never be brought to the westward of W. by N., in a ship of heavy draft, or to the southward of west with a smaller vessel. The light-ship will be readily distinguished from ordinary cruising vessels, from having her two lower masts and topmasts only aloft, and from her hull and masts being painted a bright red, also from having inverted cones of basket-work six feet in diameter placed over each of her topmast heads. For the present she will hoist at night an ordinary ship's light, until a better one can be provided. She is provided with a set of Marryat's signals, in order to communicate when requisite with vessels in the offing. She has on board a European captain and Chinese crew to attend her, and it is hoped will prove a rendezvous for the European pilots, whence they can board in-bound vessels. It is proposed that when from her a stranger is observed to be running into any danger, she first fires a gun to arrest his attention, and then hoists Marryat's signal in Part V., No. 1680, " Vessel is running into danger," followed by the compass signal of the course to be steered to avoid it.

Second—Contracts have been entered into for building a beacon tower of masonry, to be twenty feet square at its base, and fifty feet high, and tapering off to ten feet square at that altitude, and to be surmounted by a mast or spar fifty additional feet—thus making its whole height one hundred feet. This beacon will be erected on the south shore, near what is known to pilots and others as the " Three Trees." When completed, the beacon is to be whitewashed, and the masts to be painted black, to afford the most distinguishable contrasts, and will be seen in an ordinary clear day before losing sight of the hull of the light-ship.

Third—A large nun buoy painted red has been placed upon the southeastern extremity of the Wusung North Spit, in three fathoms water at lowest spring tides.

Fourth.—A large nun buoy, painted black, has been placed upon the northeastern extremity of the Wusung South Spit, in three and a half fathoms water at lowest spring tides.

Fifth—The three poles on the inner angle of the stone fortification on the right or northernmost bank at Wusung, used as leading marks for the entrance of Wusung river, are to be replaced by three new ones, each sixty feet high. The two rear one's are to have crows nests built around them, and will be painted red. The pole in front will be shorter than the other two, and have on its top a bull's-eye or target, and will be painted white. The white poll between the two red poles is the leading mark for entering the Wusung River.

Sixth—Eight iron first-class buoys have been ordered from England. When received, I would recommend their being placed in equal numbers alternately, along the inner edge of the north bank, upon its most projecting points, to be hereafter determined by soundings, and upon the northernmost projecting points of the south shore bank. It may be well to place one of these buoys, or the refuge buoy beacon invented by Captain George Peacock, R. N., which is admirably adapted to this position, as channel buoy, " Gutzlaff bearing south 15 miles," and one or more small buoys to mark the middle ground in the Wusung River ; cask buoys would be all-sufficient for this last purpose. I would recommend that all these buoys should be numbered and painted according to the following rules, which are those adopted for all buoys on the coast of the United States by law of Congress, and are, I believe, those recognized and sanctioned by the universal usage of all the principal maritime nations, viz. :—" In entering a harbor from seaward, channel buoys with black and white perpendicular stripes may be passed close on either hand. Buoys with red and black horizontal stripes are on obstructions, with channels on either side of them, and may be left on either hand in passing. Red buoys with even numbers should be left on the starboard hand ; black buoys with odd numbers should be left on the port hand."

I have the honor to be, very respectfully, &c., your obedient servant,

George Henry Preble, Lieut. U. S. Navy.

To Robert C. Murphy, Esq., U. S. Consul, Shanghae.

The Light Ships of Five Fathom Bank, off Cape May, and of Cross Ledge Shoal, Delaware Bay, have resumed their stations.

Philadelphia, March 26, 1856.

St. Pierre and Miquelon, Feb. 9.—The Governor has directed the publication of the following notification of the establishment of a system of fog signals at the light-house off Point Galantry, for the benefit of vessels approaching St. Pierre and Miquelon :—A system of signals during a fog has just been adopted, under the orders of his Excellency the Admiral Minister of the Marine and of the Colonies, at St. Pierre and Miquelon, at the Lighthouse at the Point de Galantry. In consequence, it is made known to navigators that for the future, from the 1st April to the 1st November, in each year, there will be fired at the said light-house, at St. Pierre and Miquelon, during thick fogs, two guns every two hours, at an interval of three minutes between each, from 6 o'clock in the morning to 6 o'clock in the evening. Independently of these regular signals, gun for gun will be returned to vessels that may be desirous of ascertaining their position by this means.

The ship Chrysolite, on the 21st of Sept., 1856, struck on a shoal and knocked a piece out of her false keel. The shoal is in lat. 00 deg. 56 min. S., lon. 22. deg. 38 min. 30 sec. W., in the track of vessels bound from the Cape of Good Hope, or that region, to the United States or Europe.

The Bark Crown, of Liverpool, in Feb., 1856, struck on a shoal in lat. 00 deg. 57 min. S., lon. varying from 23 deg. 12 min. to 23. deg. 38 min. according to the different means used to determine it. I think the Chrysolite's and Crown's shoal is the same, as the difference of longitude is not so great to one accustomed to compare different statements of that kind as to cause the belief in two shoals.

Sweden—West Coast—Buskar Light, Winga Sound.—Official information has been received at the office of the Light-house Board, that the Swedish Royal Marine Department has given notice that the Buskar Light, in Winga Sound, in the Kattegat, at the entrance to Gothenberg, which since the 1st Sept., 1854, has shown a red light to seaward ; and a bright light towards the sound, has been partially altered, in order that it may be seen farther off.

It now shows a bright light to seaward to a vessel at a distance but on a nearer approach the red color gradually overpowers the white light, sufficiently so to render it easily distinguishable from the two bright lights on Winga beacons, and from the leading Botto light.

The two Winga beacon lights remain as before—one a fixed bright light, the other (that is, the northeastern), a bright light varied by flashes at short intervals ; and they are seen in one on the bearing of N. N. ½ N., and S W. ½ S.

All bearings are magnetic.—Variation 8 deg. W.

Buoyage of Charleston Bar.—The following ehanges have been made in the buoying of Charleston Bar:

At the main ship bar the outer, middle, and inner buoys have been moved from the middle to the Northern edge of the Channel. The outer bar buoy is a large 1st class iron nun buoy, painted red, with the No. 2 in white, and is placed in 20 feet of water at low tide ; Charleston light bearing N. W. ½ N. Rattle Snake Shoal Light Vessel N. E., Sullivan's Island outer beacon N. ¾ W. This buoy must be left on the starboard hand on entering.

The bar or middle buoy is a second class iron nun buoy, painted red, with the No. 4 in white, and is placed in 11 feet of water at low tide ; Charleston light bearing N. W. ¼ N., Sullivan's Island outer beacon N. ¼ W. North Point Folly Island W. ¾ N. This buoy must be left on the starboard hand in entering.

The inner buoy is a first class nun buoy, painted red with No. 6 in white, and is placed in 13 feet of water at low tide ; Charleston light bearing N. W. ½ N., Sullivan's Island outer beacon N. This buoy must be left on the starboard hand in entering.

At the North Channel outer buoy is a first class iron nun buoy, painted with black and white perpendicular stripes ; it is placed in 12 feet of water at low tide. Charleston light bears S. W. by W., Sullivan's Island outer beacon N. W. ¾ W., Rattle Snake light vessel E. ½ S. This buoy must be passed close to on either hand.

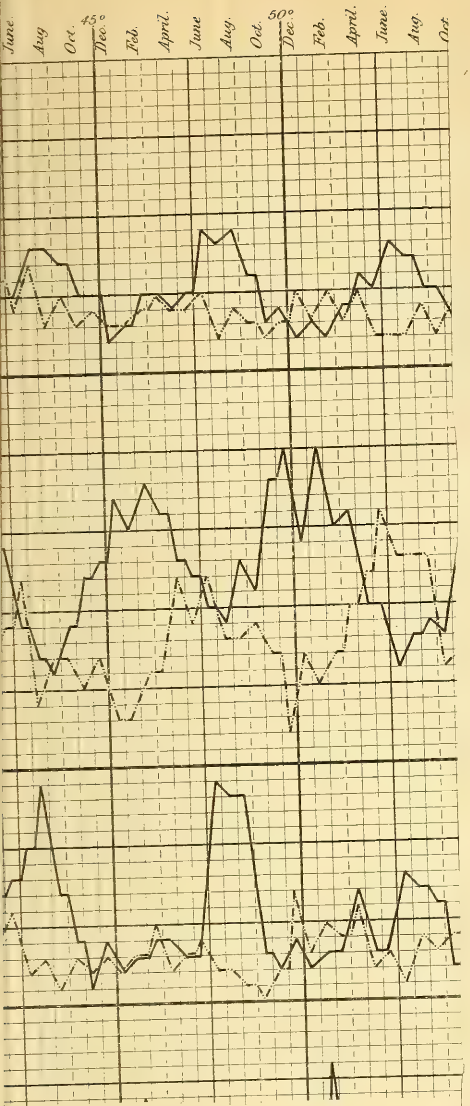
Middle buoy is a second class iron nun, painted red with the No. 2 in white, and is placed in 9 feet of water at low tide. Charleston light S. W. ½ W., Fort Sumter W. N. W., Sullivan's Island outer beacon N. W. by W. This buoy must be left on the starboard hand in entering.

Inner buoy is a 1st class iron nun buoy, painted black, with the No. 1 in white, and is placed in 15 feet of water at low tide. Charleston light bearing S. W. ¼ S., Fort Moultrie flag staff N. W., Fort Sumter W. by N ½ N. This buoy must be left on the port hand in entering.

Light Vessel at Hooper's Straits, Entrance to Tangier Sound, Md.—The Light Vessel at Hooper's Straits, entrance to Tangier Sound, Md., which was lately driven from her station by the ice, will be returned thereto on or about the 28th inst., and the light exhibited, as usual, every night afterwards.

Fog Bell at Cape Henry.—The Fog Bell at Cape Henry, entrance to Chesapeake Bay, has been so much injured lately in a gale of wind, as to prevent its being used at present. When it is ready for use due notice will be given.

IC.


June.
Aug
Oct.
45°
Dec.
Feb.
April.
June
Aug.
Oct.
50°
Dec.
Feb.
April.
June.
Aug.
Oct.

STORMS AND RAINS IN NORTH AND SOUTH ATLANTIC.

EXPLANATION

The data for this Plate are furnished by Maury's Storm and Rain Charts, including observations for 107,277 days in the North Atlantic, and 158,025 in the South, collated by lieutenant J. J. Guthrie, at the Washington Observatory in 1855.

The heavy vertical lines, 5°, 10°, 15°, etc. represent parallels of latitude, the other vertical lines, months, and the horizontal lines, per cents, or the number of days in a hundred.

The continuous curve line stands for phenomena in the North, and the broken curve line for phenomena in the South Atlantic. Thus, the Gales curve shows that in a hundred days, in the month of January, of different years, there have been observed, in the Northern hemisphere, 36 gales (36 pr ct) between the parallels of 50° and 55°, whereas during the same time and between the same parallels, in the Southern hemisphere, only 10 gales (10 pr ct) have been reported.

The fact is here developed that the atmosphere is in a more unstable condition, in the North than in the South Atlantic, that we have more calms, more rains, more fogs, more gales, and more thunder, in the Northern than in the Southern hemisphere, particularly between the Equator and the 55th parallel. Beyond that the influence of Cape Horn becomes manifest.

M. F. Maury

Observatory, Washington,

1856

Edgartown Harbor.—Outer Flats, Spar Buoy, red, No. 2.
Middle Flats Spar Buoy, red, No. 8.
Boston, April 9, 1856.

Notice is hereby given that the Spar Buoys on the following stations in Light House Channel Boston Harbor, have been taken up and replaced as follows:
Point Alderton, 2d class Nun Bnoy, black, No. 1.
Toddy Rocks, 2d class Nun Buoy, black, No. 3.
Hunt's Ledge, 2d class Nun Buoy, red and black horizontal stripes.
False Spit, 3d class Nun Buoy, red, No. 6.
Boston, April 8, 1856.

Lewes, Del., April 13.—Mr. George Maull, pilot, states that the Ledge Light Boat is no moored in her proper place, being too far to the westward.

LAUNCHES.

At Black Rock, March 19, barque Hiawatha, of 640 tons.
At Bath, March 17, by Messrs Houghton & Sons, ship Rochester, of 650 tons.
At East Machias, March 24, by P. S. J. Talbot & Co., schr. Minnehana, of 158 tons.
At Portland, by N. Blanchard & Son, ship Echo, of 875 tons,
At Robinston, March 24, by J. N. M. Brewer, Esq , barque Tasmania, of 385 tons.
At Newburyport, April 5, by Messrs. Currier & Townsend, ship Algonquin, of 600 tons.
At Scituate, April 5, by Messrs. Briggs & Turner, barque Almatia, of 450 tons.
At Mystic, Ct., by Messrs Irons and Grinnell, brig West, of 400 tons.
At Bath, March 22. by Messrs. Jenks, Harding & Co., ship Sowadabscook, of 650 tons.
At Newburyport, March 22, by Messrs. Currier and Townsend, barque Swallow, of 350 tons
At Castine, March 29, by Saml. Noyse & Sons, ship Edward Hyman, of 400 tons.
At Boston, March 18, ship Alarm, of 1200 tons.
At Quincy, March 13, ship War Eagle. of about 1200 tons.
At Bath, by Mr. Springer, ship Eastern Star, of 1000 tons,
At Bath, April 8, ship Mont Blanc, of 600 tons.
At Bristol, Me., April 5, by J. H. Chamberlain, Esq., a ship of about 800 tons.
At East Boston, March 23, by Donald M'Kay, Esq., ship Minnehaha, of 1800 tons.
At New-York, April 7, by W. H. Webb, Esq., steamship Cuba, of 1000 tons.
At New-York, April 7, by G. & J. Steers, steamship Adriatic, of 4,144¾ tons.
At Belleville, N. J., April 5, by C. C. Joselman, Esq., schr. Walter Raleigh, 134 feet, 32½ feet breadth, 12½ feet hold.
At East Boston, April 8, by E. Jackson, Esq., ship Lucy and Harriet, 160 feet long, 34 feet breadth of beam, 22 feet hold.
At Mattapoisett, April 7, a barque, of 396 tons.
At Medford, by James O. Curtis, Esq., ship Silver Star, of about 1200 tons.
At Freeport, April 2, ship Harasecket, of about 1000 tons.
At Baltimore, April 5, by J. S. Brown, Esq., schr. Federal Hill, 85 feet long, 24 ft. beam. 6½ ft. hold, 100 tons.
At Newburyport, March 18, by G. W. Jackman, Jr., ship Black Prince. of 1000 tons.
At Mystic, Ct,, April 8, by Maxson, Fish & Co., ship Aspasia, of about 700 tons.
At Owl's Head, March 29, Schr. Princess, of 247 tons.
At Westport, schr. Kate Cory, of 125 tons.
At Canton, Md., April 9, a barque of 450 tons
At Brooklyn, April 14, by Layton & Hurlbut, ship Graham's Polly, of 1000 tons.
At Owl's Head, April 5, ship Child of the Regiment, of 1300 tons.
At Freeport, April 2, by Capt. Enos Soule, ship Harrassecket, of 1000 tons,
At Freeport, April 5, by Messrs. C. & G. Bliss, barque Nacoockee, of 500 tons.
At New-York, April 23, by W. H. Webb, Esq., ship Intrepid, of 1200 tons,
At Thomaston, April 10, barque Liverpool, of 450 tons.
At Bristol, Me., April 6th, a ship of 800 tons.
At Manitowoc, April 14, by S. Bates & Son, schooner S. Bates, of 173 tons.

ICONOGRAPHIC CATALOGUE OF THE U. S. NAVAL LYCEUM, AT THE NAVY-YARD, BROOKLYN, N. Y.

NATURAL HISTORY.

Part II.

SECTION II.—GEOLOGY.

The task of condensing the great "Stone book of nature" into the limits allotted us in the present article, is perhaps the most difficult which could have been assigned. Nothing can be omitted without injury to the subject, while, if nothing were to be omitted, our catalogue would assume the gigantic proportions, which Punch ascribed to that of the London Crystal Palace. To an uninstructed person, nothing can present a more confused and chaotic appearance than rocks. Nor would he have been at all singular in his opinion of them, until within the last twenty-five years; for the knowledge which was possessed concerning them, amounted to nothing more than was necessary and unavoidable for the successful prosecution of mining. At the present day, however, science has, in a degree, fathomed the mystery of the internal structure of the earth, and reduced apparent chaos to order.

All rocks may be primarily divided into two classes; stratified—that is, disposed in layers or strata: and unstratified—consisting of huge, irregularly shaped masses. The various kinds of stratified rocks are always found to observe a particular order, as they overlie one another in the earth's crust. Thus we never find chalk beds below coal, nor coal below slate, although, either chalk or coal may be immediately above slate.

Even though some particular rocks may not appear in any given place, yet all which are present, are in exact order.

Penetrating through the stratified rocks, at any given point we always find them resting upon the unstratified. Sometimes the unstratified break through, and rise above the stratified; yet they always maintain the position of the last in the series. A clear idea of this subject may be obtained, by reference to any of the geological charts now so common in schools and libraries. The unstratified rocks are called *Igneous*, because they are the result of the cooling of the surface of the molten globe, and bear every trace of the action of fire. When they have been thrown up through openings or chinks in other rocks, they are termed *volcanic*. These rocks are of a hard, crystalline appearance. Four minerals enter into their composition, namely, mica, quartz, felspar, and hornblende: and the names given to the rocks vary with the composition, as granite, syenite, and greenstone.

The stratified rocks have all been deposited by water, and are therefore termed aqueous or sedimentary. Their order and classification are shown in the following table. Immediately above the granite we find the

Primary.—Gneiss, Mica and Talc Schists, Clay Slate.

Transition.—Greywacke, Silurian, Old Red Sandstone.

Secondary Formation.—Mountain limestone, coal series, magnesian limestone, new red sandstone; shell limestone and marls; lias limestone and shales; oolite limestone; chalk beds and green sand.

Tertiary.—Blue and plastic clays; Gypsum; sandstone and calcareous grits.

Diluvial clay with boulders: alluvial sand and gravel; vegetable soil.

The first class of stratified rocks being the primary, are usually of the same hard and crystalline character with the igneous. One of them—gneiss—is often so like granite, as to be hardly distinguishable from it. In this group we find the laminated slate rocks—from which we obtain the roofing slates.

The granitic and primary rocks are well represented in the Lyceum. A collection of granites used in the United States dry dock, illustrates the most valuable and important varieties in the United States. The gneiss and slates are taken from many different localities, chiefly from our own country. The collection of lavas and volcanic rocks would well repay a visit. It is believed to be one of the finest collections in the country. In regard to the geological department, in general, however, we regret to say, that little has been done to give it completeness.

Many important rocks are wholly unrepresented, and we trust that the newly awakened zeal, on the part of the members and friends of the Lyceum, will speedily make it all that it should be.

In the department of Palæontology, or fossil remains, the collection is interesting, and possesses some rare specimens.

A class of stratified rocks, usually found next above the primary, and never separated from these by any other, bears the name of the *transition rocks*. They have been deposited from water, and then acted upon by fire, whence the name. In these and the rocks above, we find remains of plants and animals, which are presumed to have existed upon the earth during their formation. In the greywacke, seaplants are found, together with corals and sea-molluscs. In the silurian we find in addition to the foregoing, *crustacea*, or jointed shell-fish, and *annelidœ*, or sea-worms. This was the period of the ammonite and nautilus, and the trilobite.

Above the transition rocks, lies a series of great importance, usually called the *secondary formation*. The first of the series in this formation is the *mountain limestone*. This is composed of fragments of ancient shell, and corals. The *lily encrinite*, so called from its resemblance to that flower, is found here, and also many allied species. There are some fine specimens of these *crinoidea* in the collection. The two genera which have attracted most attention, are the *lily encrinite*, and the *pentacrinus briareus*. The former consists of a vast number of little joints, forming a column for the support

of a cup-like body, from whose margin proceed five articulated arms, divided into fingers, surrounding the mouth.

Coal Measures.—These consist of irregularly interstratified beds of sandstone, shale and coal. That coal is the result of ancient vegetation, is now undisputed. The great size of many fossil plants, and the vast accumulation of vegetable matter in the coal formation, render it probable that the vegetation of the early periods of the globe was far more abundant than at the present day; and this view is supported by the discoveries and investigations of chemistry. The fact, also, of the existence of coal in the frozen regions of the earth, renders it probable that these regions must at one time have been exposed to the same heat which now exists only near the equator.

Above the coral are found beds of sandstone, called, from its color and situation, the *new red sandstone*. Sandstone is in general formed of grains of quartz and other early rocks, worn away and deposited in the bottom of the seas. It is well adapted for building purposes.

Next comes a series of limestone beds, called the *magnesian limestone*, from the vast quantity of magnesia found in it. Mixed with these beds are to be found others, chiefly consisting of marl and gypsum.

The *shell limestone* derives its name from its containing an unusual quantity of shell-fish. In it we first find the remains of animals fitted to breathe the atmosphere. This is the age of those monstrous reptiles, the *plesiosaurus* and *icthyosaurus*.

Next comes the *lias* group*, the principal beds in which, are known by the names of lias limestone and alum shale; the latter being the source whence the alum of commerce is obtained.

A series, next above the preceding, consisting of beds of limestone, clay, and marl, obtains the name of the *oolitic group*, from the circumstance that one particular bed of it is composed of minute egg-like grains.

The chalk formation, the uppermost in the secondary, consists of beds of bluish clay, green sand, and chalk.

At the time of the deposition of the chalk group, it would appear that a very great unevenness of surface had been produced, by volcanic and other natural causes. At this stage, there appears to have commenced a new deposit occupying the troughs or hollows between the elevated parts of the solid surface. Paris and London are situated above deposites of this kind. The general name of the tertiary formation has been given to these deposits. Here we find the first land quadrupeds, belonging chiefly to the order ***Pachydermata*** (thick-skinned), but wholly different from those of the same order now inhabiting our earth.

After the formation of the tertiary rocks the earth seems to have become a scene of frequent and violent inundations, which wore away great quan-

* A corruption of the word layers.

tities of clay, and broke off vast masses of rock, and spread the whole together over the surface. This constitutes the upper covering of the bones of the earth.

In all the stratified rocks above the primary, more or less of the relics or traces of animals and plants occur, sometimes called petrifactions, but more commonly, *organic remains.* That branch of geology which gives the history of these remains was formerly denominated *oryctology*; but is now called

PALÆONTOLOGY.

In a few instances, animals have been preserved entire in the more recent rock. Elephants and rhinoceroses have been found encased in frozen mud and sand in Siberia, covered with hair and fur as some elephants now are in the Himalaya Mountains. Frequently the harder portions of animals are preserved entire. In general, however, we find the forms, even down to the most minute particulars, cast, as it were, in solid rock.

Fig. 25.

The adjoining cut (Fig. 25), represents a cast of this character. It is a fish of the species known by the hard name of *Eurynotus tenuiceps* (Agassiz) and purports to have come from Middletown, Conn. It is in a slate rock of a fine and even texture, and the most minute lines are accurately preserved, down to the transparent fins, while in some places, one can almost discern the color of the animal, so finely are the lines drawn. Nor is such a specimen as this singular or unusual. We find the rocks bearing the marks of the feeble rain-drop, so accurately as even to chronicle the direction of the wind at the time; primeval birds, as they stalked over the muddy banks of some ancient stream, have written their names upon their tombstones with unconscious feet—the giant forest tree has been preserved in stone, complete in every leaf—the "medals of creation." The recent science of *comparative anatomy* reveals to us the astonishing fact, that so mathematically exact is the proportion between the different parts of an animal, "that from the character of a single limb, and even of a single bone, tooth, or scale, the form and proportion of the other bones, and the condition of the entire animal, may be inferred." It is clear from the preceding statement, that no individual can hope to possess himself of all the requisites for successfully determining organic remains. Hence the geologist resorts for aid to the botanist, the zoologist, and the comparative anatomist.

In the geological cabinet of the Lyceum, which, though small, is highly interesting, there are good specimens of the coal flora, fishes, and portions of animals, perfect shell-fish, and many singular concretions. These concre-

tions are a puzzle to geologists, and are likely ever to remain such. One which may be particularized, and which is quite common in our western rivers, consists of a ball of hard sandstone, coated with a crust of iron pyrites. The donor states that they are of various shapes, and differ also in their internal structure; some radiating from a centre, and others, like the present specimen, presenting a smooth round ball, destitute of radiation.

The fossils of the chalk formation are highly interesting, and the collection at the Lyceum is quite full. Below the chalk no genus is found that embraces any living species. It is a little singular that only one species of birds has been found in chalk.

Fig. 26.

A large collection of fossil bones next claims our attention, one of which, a tooth, (Fig. 26) we have selected for illustration. The bones are labelled as the "fossil remains of a Mastodon." Although some little doubt exists as to the particular genus to which the bones belong, there is no doubt as to the fact of their belonging to one of the huge Pachydermata of ancient times, and will afford a convenient text for a brief description of these animals. It is probable that the above represented tooth belongs to a mammoth. And this supposition is supported by the fact that, the mastodon and mammoth are frequently confounded in this country, where the remains of the largest species are found.

No less than seven species of Mastodon have been discovered in a fossil state. The largest species has been found in almost every part of the United States, though most abundantly in the salt licks of Ohio and Kentucky. In 1845, the skeleton of a Mastodon, almost entire, was dug up in New-Jersey. It was purchased for Harvard College. A more gigantic and perfect skeleton was found in a peat bog, in Orange Co., N. Y., where it stood in an erect position, as if the animal lost its life by getting *mired* when in search of food; it weighed 2000 pounds, and is now, or was, owned by Dr. John C. Warren, of Boston.

The Megatherium was an enormous animal, which was once abundant in the vast plains or pampas of South America. It was larger than the Rhinoceros, and its proportions were colossal. Its body was 12 feet long, and 8 feet high; its fore feet were a yard in length, terminated by gigantic claws; its thigh bone was nearly three times as thick as that of the elephant.

The Mylodon, also found in South America, was of massive and singular proportions. Its body was shorter than that of the hippopotamus, but was terminated by a pelvis, as broad as that of the elephant, and deeper, resting on two massive but short hind legs, with feet as long as the thigh bones. The tail, as long as the legs, and very thick and strong, was probably used

like that of a kangaroo, to support the body, when the animal raised its anterior extremities.

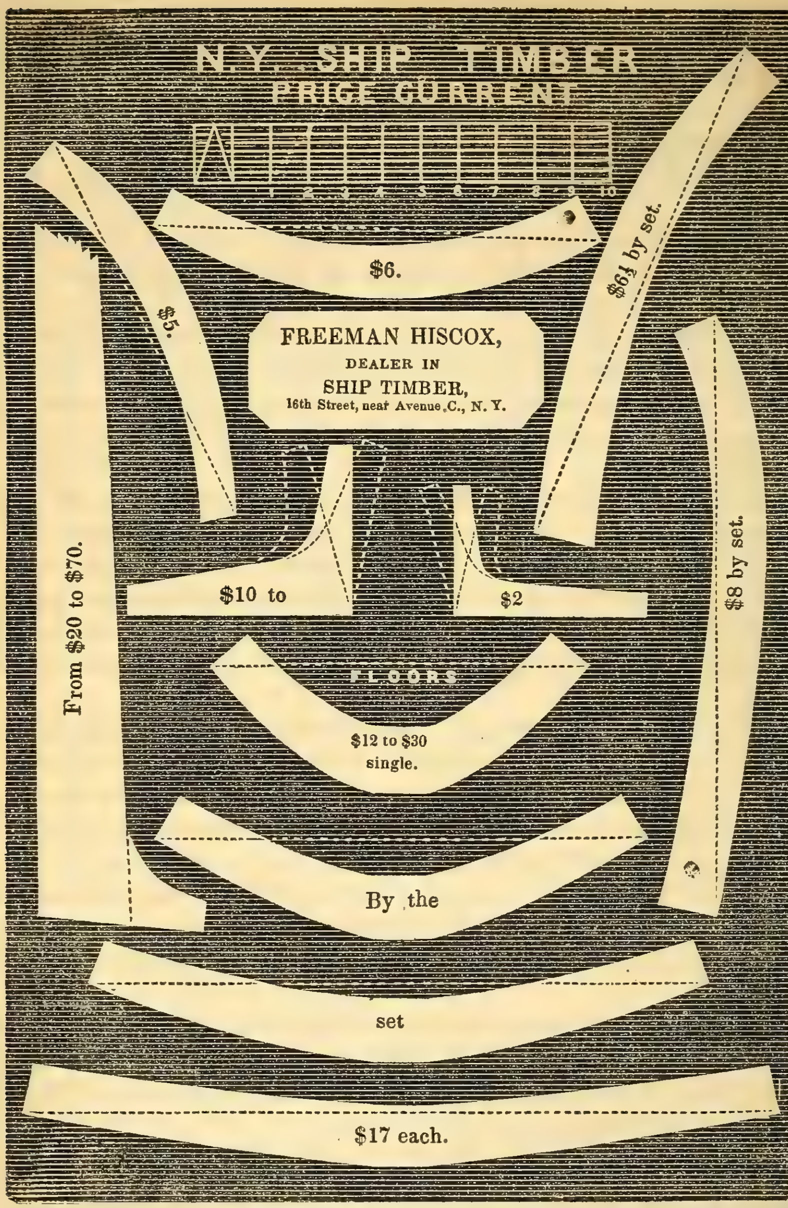
But of all the mighty animals which have walked this earth, precedence must be given to the deinotherium. Its length must have been 18 feet. One of its most remarkable peculiarities consisted in two enormous tusks, at the extremity of the lower jaw, which curved downwards, like those of the walrus. Its general structure seems to have been adapted for digging in the ground.

We are apt to consider these enormous animals as monsters which are somewhat akin, in their reality, to the fabulous heroes of Scandinavian history. The mind rather shrinks back disgusted, from the contemplation of their unwieldly forms and mighty frames. But when we consider them in connection with the condition of the earth at the period in which they flourished, this sentiment gives place to one of unalloyed admiration and wonder at the complete adaptation of their structure to the purpose for which they were designed.

Much time and space might be given to other branches of this science It would be a matter of interest to examine the subject of geological geography, noting the condition and appearance of the earth at different stages, and its gradual development. The general conclusions to which geology leads us may be briefly stated, and although not enough has been said in the foregoing pages to justify such conclusions, they are nevertheless all tenable.

It appears that all the principal chains of mountains on the globe are composed of primary rocks, stratified and unstratified; while the secondary lie upon their flanks at a lower level; and the tertiary strata at a still lower level. A similar process of the elevation of continents at successive epochs, has been going on in all parts of the globe. Hence, there is every reason to suppose that continents once above the water, have sunk beneath them: for since the quantity of matter in the globe has always remained the same, its diameter cannot be enlarged permanently, and as one part rises another must sink.

We have no reason to expect that new discoveries in unexplored parts of the earth will essentially change the important principles of geology. Slight modifications of those principles are all that can reasonably be expected from future researches.



A set of floors and futtocks, $9 each Oak Flitch, 30 cents per cubic foot ; oak plank, $36⅔ to $40 per M : deck plank, $35 per M. ; hackmatack timber, 25 cents per cubic foot ; chestnut, ditto ; cedar, 30 to 50 cents : yellow pine timber, rough, 35 to 45 cents per cubit foot ; ditto, sawed, $28 to $30 ; yellow pine plank, $28 to $30 per M.

OAK KNEES—5 inch $2 50 ; 6 inches, $5 ; 7 inches, $7 ; 8 inches, $10 ; 9 inches, $12 ; 10 inches, $15 ; above, $1 50 perinch.

HACKMATACK KNEES—5 inches, $1.50 ; 6 inches, $2 50 ; 7 inches, $4 25 ; 8 inches, $6 00 ; 9 inches, $7 ; 10 inches, $9 00 ; above, $1 per inch.

Yellow metal, 25 cents, at 6 months ; copper sheet, 28½ cents, ditto ; copper bolts, 31 cents, ditto ; composition nails, 19 cents, ditto.

THE

U. S. Nautical Magazine,

AND

NAVAL JOURNAL.

Vol. IV.] JUNE, 1856. No. 3.

THE MOST PROFITABLE SIZE AND SHAPE FOR VESSELS.

The question of utility and profit in connection with the size or bulk of vessels, has been one of more than ordinary interest to every ship-owner and commercial man—not only in the United States, but throughout the commercial world. In order to arrive at any definite idea of the true principles involved in this question of bulk, we must commence at the base line of all flotative transactions, whether intended for profit in transporting the peaceful fruits of *industry*, or for the belligerent purposes of wilful and wanton destruction, denominated war. It cannot, it will not be doubted, that *buoyancy* forms the basis of every transaction in nautical commerce, or naval hostility. Whatever may be said in reference to the size of vessels, it cannot be doubted that they are relatively large or small, in proportion to the amount of buoyancy they possess.

When a vessel is called large, it is understood that she is above mediocrity in bulk, compared with those engaged in the same trade or service; but the terms, large or small, long or short, wide or narrow, are relative. A vessel, five hundred feet long, cannot be said to be long, if the breadth and depth are in accordance with the usual proportions; neither can a vessel be said to be short, if no more than the usual proportion of breadth and depth have been incorporated with her construction. Hence we arrive at the plain, common-sense conclusion, that *large and small*, *long and short*, *wide and narrow*, *deep and shallow*, are only relative terms, and furnish no just conception of the size, capacity, or capabilities of a vessel. For example, the Cunard steamer Persia is said to be a large vessel; and, in order to establish and confirm the announcement, her length is given. But let us inquire why her breadth was not given, as a demonstrative proof. Is it not because her width does not exceed that of other vessels of her class having less length than the Persia? We answer, that it is even so. But, again, when speaking of the width of steamers, the Persia is called narrow—and

why? Simply because she has a greater proportion of length to the breadth than other steamers. But, again, she is called a deep vessel—and why? Because her breadth and depth are disproportioned as compared with other vessels. We shall find the same relations existing in reference to the size of vessels; but however prevalent the custom, however widely extended its application to vessels, *the practice has no significance in the laws of science.* A ship or a boat can only be large when it fills the measure of utility, in the service for which it was intended. A ship is large, when the trade for which she is designed is not sufficient to provide business for a larger, and she is too large when the business for which she was built is insufficient to provide a cargo for her capacious hold; and so, in like manner, the ship is small, when the business is beyond the capabilities of one vessel, and insufficient for two. But these definitions have no sort of connexion with the length, breadth, or depth of a vessel.

We are now thrown upon the laws of nautical science for an answer to the question forming the caption of this article, for a solution to the problem of the most profitable size for vessels. We lengthen vessels to make them more capacious. It is possible to construct a vessel so long, that she will have no capacity for cargo; and the manner of doing this can be made plain to every comprehensive mind. Suppose a ship were built 200 feet long, 25 feet wide, and 25 feet deep, with a sheer adapted to the length, what nautical mechanic is there who does not see that such vessel would carry nothing but ballast. In the first place, it would require half of her capacity for ballast to keep her upright, and then the centre of gravity of the remaining half of the capacity would be too high to admit of the stowage of cargo, as it would consume the small amount of stability already secured by the ballast. We should say of such vessel, that she was very long, or that she was very narrow. We will, before furnishing another phase of this subject, examine the flotative properties of such vessel, assuming the exponent of capacity of such vessel to be .6, and the upright position to demand a draft of 18 feet above base line, we now have 200 feet $\times$ $25 \times 18 = 90000 \times .6 = 54000$ cubic feet of displacement, divided by $35 =$ very nearly 1543 tons displacement; of this, the vessel itself would consume more than half, if substantially built of oak frame, and double decked, leaving, say 700 tons excess of displacement, which can only be used for ballast, to impart stability and secure an upright position. It would not be said that such vessel was unprofitable because it was too large, or because it was too sharp, nor yet because she was too small; but it would most likely be said, that it was because she was too narrow. *This is the universal error, and is fatal to progress.* We will present another phase, and then draw our conclusion. We will take half of the former length, and one-half the depth above base line, with the same breadth, and then witness the result, 100 feet long $\times$ 25 wide $\times$ 9 deep$=22500 \times .6 = 13500 \div 35 = 385.7$ tons—

just one quarter of the displacement of the former vessel. The weight of this vessel would probably be about 150 tons, leaving about 235 tons of displacement for stores and cargo, (no ballast being required,) inasmuch as the weight of the topsides of the vessel is reduced faster than the displacement; the weight is but one-fourth of the displacement of this vessel, it would not exceed one-fifth of that of the former. Such vessels have been profitable, not because they were small or large, long or short. In the first example it was said the vessel was narrow, but this one is no wider, and yet she would most likely be called wide by some, and shallow by others, while a third party might say that she was short. Hence we see that the dimensions of a vessel furnish no clue to her real size; for we must certainly admit, that when the size of a vessel is the subject of inquiry, it is with reference to what cargo she will carry. If guided by this principle in this case, we must say that the small vessel is the largest; hence we discover how perfectly absurd the philosophy which measures the size of vessels by their principal dimensions, or their length, breadth, and depth. Having removed the obstacles, and made the subject clear, as we think, we next proceed to show how the relative size of vessels should be determined with reference to their being most profitable to their owners.

If the reader has learned anything from the two examples furnished, he has learned that it is not the dimensions, nor yet the flotative surface, that makes a large vessel, for we may have the length of 500 feet, and no buoyancy beyond that supplied by the material itself in its specific gravity; so also with depth: hence we say, that length and depth are unprofitable for the conveyance of cargo. This cannot be said of breadth. A vessel cannot be wide without being relatively short, because width implies a proportion of breadth to the length; it also implies a proportion of width to the depth; hence we discover that as we increase the breadth, we increase the capacity of the vessel for cargo. But we are yet left in the dark; we are at sea, without nautical instruments for observation. *There is no science in the present mode of building vessels.* The principal dimensions of a vessel determine her shape to a very great extent. If we furnish the dimensions of a vessel, we furnish the elements of form,—her model, for all practical purposes, and we care not who gives shape to the lines; the imprint is there, and cannot be avoided. Some features, it is true, may be incorporated, which will add to or take from her as a performer, but it is a family likeness, and cannot be avoided any more than a man can escape from his own identity. It may require a practiced eye to discover it, but it is there nevertheless. The shipbuilder who builds by principal dimensions furnished by the owner, or by himself, *is but an artizan, and nothing more, degrading the dignity of science* in every ship he builds. Science takes no cognizance of principal dimensions, and that ship which is built by principal dimensions, has no science incorporated with her construction, and this principle is univer-

sal in its application. It applies to every vessel as much as to any one, if built by principal dimensions, or a given length, breadth, and width. In order that we may be fully, and indeed fairly understood, we will enlarge, and say that the vessel which is built by such dimensions as will furnish a certain amount of registered tonnage, has no science developed in her form; and we will go farther, and add, that where the dimensions are arbitrarily determined or selected, *science has repudiated the model in advance*, and never can regard it with favor, because there is no science in the law of tonnage which gives rise to dimensions.

We are taught to regard the *ship* as the nearest approximation to animate creation of all the works of science and art, because the laws of the universe are more fully developed in securing an adapted form, than in other inanimate objects, and because we expect to find, at least, the shadow of intelligence in her form and adaptation. The painter and the sculptor takes *nature for their text-book*, in bringing out the beautiful and the true. We applaud their genius, and elevate them to the pinnacle of fame, because there is an intuitive principle in man, which teaches that there is nothing beautiful which is not true; hence the frequent application of the term beautiful to vessels, inasmuch as it is at once conceded that *if beautiful, it must be true* to the principles supposed to be developed in their construction. And what are those principles? Are they those governing the grandest and most important departments of the universe—*water and air?* Are they based upon those laws which govern the ocean both in calm and storm, and determine the utmost limitable altitude of its mighty billows, when lashed in all the fury of their unabated strength? We answer, No! The principles upon which nautical or marine construction are based in the United States, may be found in the Government law of *Registered Tonnage.* In England, the prejudices engendered by the old law have still sufficient force to give impetus to preconceived notions; and thus, on both sides of the Atlantic, both in the Old and New World, pride of opinion reigns without a rival—*prejudice riots without control.* But we may be asked in what respect the laws of nature conflict with the present practice, and why something more congenial to the laws of nature has not been produced, when so many thousand minds have been engaged in its pursuit?

To the first interrogatory we answer in all respects; to the second, we say the causes are numerous. Every man has his own way of understanding his own interest, and is ready to adopt that mode of doing business which promises the greatest profit. If, in the pursuit of a legitimate business, he finds that a law designed for his protection and profit is at variance with his practice, and unless the law is altered or his course is changed, his neighbor will obtain an undue advantage, it is not to be supposed that he will become a political economist, and investigate the bearings of the law upon science, and the best interests of his country. It is supposed to be enough for him

to know that he is engaged in a race of competition, and unless he makes use of those evasive rules adopted by his neighbor, he will be less fortunate in securing the fruits of his enterprise.

A full development of this principle was exhibited in the clipper ship *Era*, which was carried to such excess *that a large majority of those vessels had smaller exponent of capacity than ocean steamers.* The result was, that in running with each other for speed, a reaction was brought about, and another channel was obtained for the enterprising ship-owner; and now we have the single-decked (midships) schooner, measuring from 600 to 800 tons, with no increased amount of science developed in her construction, because built, and consequently shaped, arbitrarily by principal dimensions.

It is amusing to hear the various arguments adduced to sustain the various kinds of build, which have been introduced within the last century. It was confidently affirmed, when narrow and deep ships were the order of the day, that wide ships would roll more than narrow ones, and that three parts of beam against two parts of depth was too much width, and that a ship was actually endangered with more. But the tide of interest has turned, and now we find larger vessels than those to which we allude with three parts of beam to only one of hold. We inquire how about their rolling propensities, they being so wide, and no complaint is made; they are said to be good sea-boats. But why all this change? we are asked. We say, a new discovery has been made in the *evasion of the tonnage laws.* These vessels are single-decked midships where their depth is measured, and are measured different from double-decked vessels. (We hope their top-hamper on the ends, and weakness midships, will not bring them into disrepute.) Did science suggest this supposed improvement? No.

The greatest difficulty the thinking man encounters in his search after the true and the beautiful in Marine Architecture, is found in the prejudices engendered by avarice. The man of dollars will not allow his mind's eye to be turned from the habits of his life, sufficiently long to investigate for himself. If a man of marine science tells him that a vessel can be built that will carry more and sail faster than any he has yet seen, the first question he will ask will be, How long, wide and deep will she be? showing at once his vague ideas of science; he is ready to approve or condemn, just as the dimensions, if furnished, approximate or derogate from his ideal proportions.

If the Marine Architect copied from nature, as the artist does, then there might be room for hope in the future, although his copy is of the true and beautiful; which is essentially distinct, inasmuch as *matter is shaped and penetrated by forces that are not material, obeying laws and attesting intelligence everywhere.* If we arrive at a portion of matter that expresses nothing that signifies nothing, that portion of matter *has neither the idea of proportion, nor yet of beauty attached to it.* Wherever we find proportion we find

beauty, and wherever we find beauty we find a shade of intelligence; and this remark is applicable to purely physical nature, as well as to men and animals. Analysis scarcely reaches nature in any other than an organized form. Genius, wherever developed, attests the presence of an immortal spirit, which shines through the darkest and deepest mazes of subtlety. The man of science cannot regard the ocean as a watery waste, nor yet can he mount its foaming, crested billows, without learning that the wave itself has an organized form, a defined proportion, regardless of its bulk, and that *hydraulics were as surely intended as a law for the wave, as for the fountain or the mill dam*—designed to be one of the laws which float the ship, and not the less one of those which would cause a leak to sink her.

If, then, we are compelled to submit to those wholesome restraints in navigating the ocean, why should there not be some deference paid to those laws in giving form to the vessel? In giving shape to the wave, Nature knows neither the length, breadth or depth; and yet it has the very best form for the transmission of motion, the facility of which furnishes its destructive power. The law that sustains the propagated wave, harmonizes with the force that raised it, in adjusting its proportions and determining its power, giving motion and speed to the greatest bulk within the smallest compass, and at the least expenditure of force. *Nature repudiates* a *vacuum*, and yet if we can judge of the forms of the great mass of vessels, we cannot avoid the conclusion that the modellers were either ignorant of the fact, or that they knowingly endeavored to secure it. We give shape to vessels without the least reference to the resistance of the element we navigate, and the consequence is, we pay tribute to *Neptune* through his agents, the underwriters, in the waste of wealth, and to society in the more valuable or greater loss of human life.

Who is there in the world of Nautical Mechanism that has studied the well-defined laws of Nature, can attribute the great bulk of disasters that make part of the daily news, to the dangers of the sea? We say that at least one half of the number may be attributed to the dangers of the shape or form of the ship. Form is every thing in Nature—can it be less valuable in Science? Why does the water rise in foam around the bow of a vessel, when impelled onward in the direction of her length? Is it not because the resistance is less at the surface of the ocean, than at any depth below? Then why not navigate the surface? why draw so much water? With respect to the vessel, is it not because it has its fullest and most obtuse angle at the forward end, at the termination of the line of flotation?

What makes vessels pitch when at sea more than when in port? Some of our ship-builders and ship-owners may regard this as a very simple question —perhaps too much so to be found in the magazine; but we tell them, in advance, that, if we may judge from their labors, they cannot answer it correctly. And we have no other means of knowing their ability to answer,

than the ships they build,and the dimensions furnished. No vessel, of any considerable length, would pitch, if her form were in accordance with that of the wave ; but would maintain a comparatively horizontal position. The reason why vessels pitch, is because of the fullest and most abrupt part of the whole body being at the ends. The consequence is, when the wave meets the bow, with a preponderance of buoyancy, it lifts it up ; and if, at the same instant, the stern is upon the summit of the passing wave, which sometimes happens, the vessel is suspended by the two ends, while the midships part is unsupported, because the equilibrium of buoyancy is found in the ends, or an amount equal to her weight. If the vessel is not of sufficient length to meet the passing sea at the stern, the stern must have a depression corresponding to the altitude of the bow. As soon as the wave passes the bow it meets the stern, and then the posterior end is subjected to a corresponding elevation, while the bow is depressed. Now, it is plain that a child may take cognizance of the manner of the movement, and, as thousands have done before, attribute it to the wave; but we say, No. The wave furnishes the oscillatory motion only,—the shape of the vessel furnishes the chief cause of both the roll and the pitch. If the fluid were not forced out of its place ahead of the vessel, but was thrown from the sides where the greatest bulk is assumed to be, the ends of the vessel might be more submerged without lifting, and the wave allowed to pass along midships, where the buoyancy would be felt by the rising vessel.

But we may be told that such a shape would be unprofitable because it would not carry—the capacity would be small in proportion to the tonnage. We say, No; such vessel would be the safest, as well as the most profitable to its owners. If any man is doubtful on this point, let him ascertain what is the largest area of surface that can be obtained within a given girt line of flotation, and its form, without reference to dimensions; and he will be brought, however unwilling, to the circle—the primary form, not only of *ocean*, but of all geometrical science. So, with the spherical body, its cubical contents are greater than any other form of equal surface. Hence, we say, while guided by the light of science, that the nearer we bring the sides of the vessel together, the less capacious that vessel becomes—in other words, the farther (*relatively*) the ends are separated, the less profitable the vessel is to her owners.

It may seem to the casual observer that we aim a blow at the very first principles of commercial progress, but to the thinking man of observation our remarks will be appreciated. If, however, they are read by any whose mantle of prejudice, like a coat of mail, is too impenetrable even for the barbed points of truth, they will fall powerless upon the judgment of such readers. But a last inquiry, and then we conclude, believing that as much as is digestible in a single article has been already furnished.

If vessels are built too wide at the ends, and too narrow midships, would

they be more capacious if widened at one part and narrowed at two? We answer, Yes; because we may obtain an equal amount of capacity, and even more, by the long, swelling side, than by the short, abrupt ends. And, in addition to this, we prove the truth of the axiom laid down, which is this, that the wide vessel draws less water than the narrow one. Hence, we not only have more capacity, but we have it at the most convenient part of the vessel—midships. But this is not all; we have less vessel surface, consequently the vessel weighs less; and inasmuch as it weighs less, it must draw less water, and consequently will sail faster, being relieved of the excess of fluid pressure, added to the absolute resistance.

But why has all this gain arisen from a transposition of buoyancy? We reply, that the laws of science have been regarded in securing a more approximate reduction of the girt of the load and immersed lines, and at the same time we have increased their area, thus reducing the surface of a vessel, and at the the same time increasing its capacity; for it must be apparent to every comprehensive mind, that if the vessel draws less water with her compliment of cargo, her depth may be reduced by the amount of the reduced draft, and the speed will be increased by the reduction of weight, as well as from the reduction of draught of water. In conclusion we say, that of all the subjects within the grasp of the human mind, there is none upon which the light of science shines with such feeble ray. We suggest societies, schools, and colleges, for the promotion of agriculture, chemistry, etc.; but alas, who cares to improve the science of Nautical Commerce, of maritime construction. The few who dare think and act on scientific principles, are regarded as addle-pated enthusiasts, or reckless adventurers upon the ocean of fame; a petty jealousy pervades the entire ranks of Nautical Mechanism, and if a builder has, or thinks he has learned something, he dare not use it, lest his neighbor should see it; and inasmuch as the idea, whether crude or polished, is not patentable, he regards this idea as his fortune, more sacred than his fame or his money, using both for the purpose of enlargement, while his darling thought he carries with him to the tomb, to be buried in the same grave. The ship-builders of the world will find one lesson worth learning, which is this, whatever is *worth knowing is worth printing*, and whatever is worth printing is worth publishing to the world. There is that scattereth and yet increaseth—this is true as it respects knowledge. Our experience is, that no man loses by imparting knowledge to others; it stimulates the giver to obtain more; it sets a real value on him who imparts. We have had as much experience in telling the world what little we know, as any ship-builder on either side of the Atlantic, and we are none the poorer for it, nor do we know the less for our distribution. We shall continue to tell what little we may chance to learn, for be it remembered, that no man knows more than he learns; then why should we be so selfish, seeing that we ourselves learned from some one else? Away with this narrow-minded prejudice, if we

would see ship-building a science, or anything more than a bundle of prejudices.

If ship-owners would consult their best interests, they would abandon the present mode of determining the size of their vessels, and pay no more regard to the tonnage laws of the United States than they do to those of China. The idea of building vessels to carry a given number of barrels to the ton, while the ton has neither a defined bulk or weight, is unworthy of the age in which we live. Let ship-owners contract for a given amount of internal capacity in cubic feet, covered by a given number of decks and parts of decks, and a given amount of displacement in gross tons, within a given draught of water, the builder to determine the amount of sail, and he will find it greatly to his advantage; and the ship-builder will also find himself the gainer, in building no more ship than he gets paid for, while the owner would find that all the ship he paid for would be available. The displacement and draught of water would regulate both the stability and the form, and inspire confidence in the builder, by bringing science to his aid to relieve him of the burden of his prejudices. Such a rule would relieve the ship-owner of the anxiety he now feels, permitting him to attend to his own legitimate business, and would separate the ship-yard and counting-house in that interfering sense in which they now so often stand connected. It would then be the merchant's business to find his wants from his ledger, and the builder's business to find the data for supplying them from his draft. Neither would be disappointed—the ship being completely measurable, could not bankrupt the builder, and the ship or schooner having the largest capacity for cargo, with the smallest area of surface commensurate with that capacity, would consequently produce the largest returns with diminished expenditure in wear and tear.

By the present mode of determining the size of vessels, the owner is furnished with the largest area of surface, and the least amount of capacity consistent with stability enough to render them not absolutely dangerous, and the largest amount of wear and tear. With the proposed improvement, it would soon be determined who were the most scientific ship-builders, as well as the best mechanics; inasmuch as science alone would determine the best shape for the highest speed with this determined bulk. Science would then be at a premium, and the United States tonnage laws and principal dimensions at a discount.

THE following extract from Sutherland's Ship Building Unveiled, written about 140 years ago, may be worthy of attention even now: "No man loses his life ashore by an unnatural death, but the cause of it is inquired into by a jury; but when a 100 or more men lose their lives in an insufficient and deceitful ship, there is no inquiry for a true account of that loss, nor any known fair method nor general rule to prevent the like great loss."

TONNAGE.

It is indeed surprising, that the United States, the largest ship-owners in the world, should be without law for the determination of a vessel's tonnage. In making such announcement, it may be supposed by some, that we have overreached the bounds of propriety; but we are responsible for the assertion, that the greatest commercial nation on the globe is without any law for the determination of a vessel's capacity. Why it is so, may be learned from a remark made by the Hon. Secretary of the Treasury, in reference to this subject. Said he, the reasons are plain,—there are so many bills of a private character before Congress, which must be acted upon, before those tending to the public good can receive attention. But shall this important measure always remain in *statu quo*? Shall there not be a lull in this storm of individual interest, sufficiently long to secure something for the commercial interests, and, as a consequence, for the interests of humanity from Congress. We say in the name of the confiding ocean traveller, and of those whose home is on the deep, something should be done at once, to secure a measure of value or determination for the size or bulk of our vessels. The law of tonnage and admeasurement, as it now stands, is a false light to the innocent, and a hiding-place for the guilty. It invites fraud, and shackles the energies of industry; it mocks the boldest thoughts and best exertion of genius, and hurls defiance at the developments of science. To the tonnage laws of the United States are traceable deformity in the shape of vessels, more ship-wrecks and disasters at sea than from any other cause. Civil jurisprudence adjudges a man worthy death who commits murder; it imprisons him who is guilty of manslaughter; while the Nautical, approves and pays a premium for the construction of such vessels as not only always endanger, but, alas! too often prove fatal to human life. We hear men talk of progressive science, and apply the term to ship-building. How preposterous, how absurd! Progressive science in ship-building, under the frowning influence of national law, is impossible. But what can be done. Shall we remain idle, while our transatlantic friends have, by persevering industry and untiring zeal, secured the best law for the admeasurement of vessels that the world has ever witnessed? It has long been a question of moment, how to improve the law and keep the tonnage of the kingdom of Great Britain at the same aggregate amount, or very nearly the same. The problem has been successfully solved by the English Merchant Shipping Act of Parliament, in 1854, as it shall be our pleasure to show, having been furnished with the testimonials by the Surveyor of Her Majesty's Customs, Mr. George Moorsom. The following copy of a certificate of survey of a sailing ship, Form No. 1, with Epitome and Formula, in connection with the accompanying illustration, will serve to show the utility and efficiency of the new English law of 1854.

Form No. 1.*

SAILING SHIP.

CERTIFICATE OF SURVEY.

Name of Ship.	British or Foreign Built.	Port of intended Registry.
Sclavonia.	British.	Whitby.

Number of decks, - - -	One.	Build, - - - - - -	Carvel.
Number of Masts, - - -	Three.	Galleries, - - - - -	None.
Rigged, - - - - - -	Barque.	Head, - - - - - -	
Stern, - - - - - -	Square.	Framework, - - - -	Wood.

MEASUREMENTS.	Feet.	Tenths.
Length from the fore part of Stem under the Bowsprit to the aft side of the head of the stern post, - - -	108	5
Main breadth to outside of plank, - - - - - -	25	2
Depth in hold from Tonnage Deck to Ceiling at Midships, -	16	5
Name and Address of Builder. (This is put in by the Measuring Surveyor at the Port of Measurement).		

TONNAGE.	No. of Tons.
Tonnage under Tonnage Deck, - - - - - - -	297.48
Closed-in spaces above the Tonnage Deck, if any, viz :	
Space or spaces between Decks. (This is in the case of three or more decks.) - - - - - -	
Poop, - - - - - - - - - -	
Round-house, - - - - - - - -	
Other inclosed spaces, if any, naming them	
Total, - - - - -	297 48–100

I, the undersigned, Measuring Surveyor of the Port of Whitby, having surveyed the above-named Ship, hereby certify that the above particulars are true; that her Name and the Port of Registry are properly painted on a conspicuous part of her Stern in manner directed by the Merchant Shipping Act, 1854.

Dated at Whitby, the day of 18

JOHN HATT,
Surveyor.

* Form No. 2 is a similar form, adapted to the details of steam-ships.

CLASS 2. A.—Formula of Rule 1, to be used in taking the measurements at the Ship, and calculating the Tonnage under the Merch. Ship. Act, 1854.
For lengths from 50 ft. to 120 ft. and Midship Depth exceeding 16 ft.

Name of Port, Whitby.

Date of Meas't, 9th May, 1855.

Ship's Name, "SCLAVONIA." * Barque.

Length, 111.5 ft. ÷ 6 = 18.583 feet, the common interval between Areas.

Depths ÷ 6, the middle depth exceeding 16 feet.

		Area 1.		Area 2.		Area 3.		Area 4.		Area 5.		Area 6.		Ar. 7.	
Depths...............		Ft.		Ft. 15.85.		Ft. 16.35		Ft. 16.35.		Ft. 15.9		Ft. 15 25		Ft.	
Com. Int. bet. bths.				2.641		27.25		2.725		2.65		2.541			
No. of bths.	Multipliers.	B'ts Ft.		Br'ths Ft.	Products.	Br'ths Ft.		Br'ths Ft.		Br'ths Ft.		Br'ths Ft.		B'ts Ft.	
1	1			20.2	20.02	22.6	22.6	23.1	23.1	22.3	22.3	20.3	20.3		
2	4			20.25	81.0	22.65	90.6	23.2	92.8	22.35	89.4	20.2	80.8		
3	2			20.	40.	22.4	44.8	23.0	46.0	22.1	44.2	19.6	39.2		
4	4			19.	76.	22.0	88.0	22.55	90.2	21.5	86.0	18.1	72.4		
5	2			17.7	35.4	22.1	44.2	22.3	44.6	20.9	41.8	14.65	29.3		
6	4			13.6	54.4	21.2	84.8	21.4	85.6	19.15	76 6	8.85	35.4		
7	1			2.0	2.0	9.0	9.0	11.0	11.0	3.6	3.6	1.2	1.2		
⅓ com. int. bet. bdths.		....			309.0 .88		384.0 .91		393.3 .91		36.39 .88		278.6 .85		
					2472 2472		384 3456		3933 35397		29112 29112		13930 22288		
					271.92		349.44		358.903		320.232		236.810		
		Ar. 1.		Ar. 2.		Ar. 3.		Ar. 4.		Ar. 5.		Ar. 6.		Ar. 7.	

Cubic Contents and Register Tonnage.

No. of Ar.	Mltp'r	Areas bro't up. sq. ft.	Pdts.
1	1		
2	4	271.92	108768
3	2	349.44	798.88
4	4	357.90	143160
5	2	320.23	640.46
6	4	236.81	947.24
7	1		
			4805.80 6.19 ⅓ com int. bet. Areas.
			4325274 480586 2883516

Cub. ft. 29748.2734 ÷ 100 = 297 48-100 Tons under deck.

Poop or other closed-in space.

Viz:

Mean Length ft.

Com. int. bet. Bths. ft.

No. of bths.	Mult.	Bths. ft.	Pdts.
1	1		
2	4		
3	1		

———— ⅓ com. int. bet. Bths.

———— ht. of space.

———— Tons.

Cub. ft. ———— ÷ 100 =

} closed in spaces, if any, naming them.

Register Tonnage.

In the case of Steam Vessels, the measurements of the actual Engine Room, and the calculations for the allowance for the propelling power, are to be given in detail on the back of the form.

* Note.—In the case of Steam Vessels, state if the Ship is of Iron, a Screw or Paddle Vessel, also her nominal Horse Power.

In the case of a Steam Vessel, the allowance for the propelling power, as calculated on the back of the form, is to be deducted from the above.

Signed, John Hatt, Meas. Surveyor

Examined by W. Moore, Draughtsman.

EPITOME OF RULE 1.

Length.—Take inside on tonnage deck (in all vessels under three decks, the upper deck is the tonnage deck; in all other vessels, the second deck from below,) from inside of plank at stem, to inside of midship stern timber or plank there (as the case may be); the length so taken, allowing for rake of bow in thickness of the deck, and for rake of stern in the thickness of the deck, and one-third of round of beam, is to be divided into the prescribed number of equal parts (which determines the stations of the areas,) according to the length, as follows:

Class 1.—Length of 50 feet and under,		into 4 equal parts.	
" 2.	" above 50 to 120 feet –	" 6	"
" 3.	" " 120 to 180 " –	" 8	"
" 4.	" " 180 to 225 " –	" 10	"
" 5.	" " 225 and upwards,	" 12	"

Areas.—Area No. 1 is at the extreme limit of the bow. Area No. 2 is at the first point of division of the length. The rest are numbered in succession, the last being at the extreme limit of the stern.

Depths.—Taken at each point of Division of the length, or station of each area, from the under side of tonnage deck to ceiling at inner edge of limber strake, deducting therefrom one-third of the round of the beam; the depths so taken, are to be divided into four equal parts, if midship depth should not exceed sixteen feet, otherwise into six equal parts.

Breadths.—Taken at each point of division of the depths, and also at the upper and lower points of the depths. The upper breadth of each area is to be set down in its respective column, in a line with No. 1, (left hand numerals,) and the rest in succession.

N. B.—The number of columns for areas will vary according to the length, as in the classes above given, and will be equal to the number of parts into which the length is divided + 1.

Measurement of actual Engine Room, and Allowance for Propelling Power.

Length from front of stem under bowsprit to back of head of post.	Breadth extreme from outside to outside of plank.	Depth at main hatchway from under side of tonnage deck to ceiling at the inside of limber strake.
79.4 feet.	23.9 feet.	14.65 feet.

NOTE.—In the case of the re-measurement of Ships, the tonnage under the late law, as stated in the Register, is to be here shown.

Reg. Tonge. under 8 & 9 Vict. cap. 89. } $203 \frac{1171}{3500}$ Tons.

And in the case of New Ships, it is desirable to ascertain the Tonnage by girting when the other indispensable duties of the Surveyor will admit of it. When this can be done the measurements and calculations are to be here subjoined, stating whether the vessel is full, sharp, deep, or shallow.

CALSS 2. Formula of Rule 1, to be used in taking the Measurements at the Ship, and calculating the Tonnage under the Merch. Ship. Act, 1854.

For Lengths from 50 feet to 120 feet, and Midship Depth not exceeding 16 feet.

Name of Port, Sunderland.

Date of Meast., 4th Aug., 1855.

Ship's Name, "Friends," * Brig.

Length 80.3 feet ÷ 6 = 13,383 feet, the common interval between Areas.

Depths ÷ 4. the middle depth not exceeding 16 feet.

		Area 1.		Area 2.		Area 3.		Area 4.		Area 5.		Area 6.		Area 7.	
Depths..............		Ft.		Ft. 15.0		Ft. 14.6		Ft. 14.5		Ft. 14.25		Ft. 13.4		Ft.	
Com. Int. betw. bths. }				3.75		3.65		3.625		3.562		3.35			
No. of bths.	Multipliers.	Bths. Ft.		Breadths. Ft.	Products.	Bths. Ft.		Bths. Ft.		Bths. Ft.		Bths. Ft.		Bths. Ft.	
1	1			21.65	21.65	22.85	22.85	22.55	22.55	21.1	21.1	19.5	19.5		
2	4			21.5	86.0	22.9	91.6	22.4	89.6	21.0	84.0	18.25	73.0		
3	2			20.65	41.3	22.7	45.4	22.2	44.4	20.15	40.3	15.0	30.0		
4	4			18.35	73.4	21.5	86.0	20.7	82.8	17.2	68.8	8.9	35.6		
5	1			.9	.9	1.8	1.8	1.8	1.8	.8	.8	.8	.8		
⅓ of com. int. betw. bths.	....				223.25 1.25		247.65 1.22		247 15 1.21		215.0 1.19		158.9 1.12		
					111625 44650 22325		49530 49530 24765		,24115 48230 24115		19350 2150 2150		3178 17479		
					279.0625		302.1330		291.7915		255.85		177.968		
		Ar. 1.		Ar. 2.		Ar. 3.		Ar. 4.		Ar. 4.		Ar. 6.		Ar. 7.	

}Cubic Contents and Register Tonnage.

No. of Ars.	Multipliers.	Areas brought up. sq. ft.	Pdts.
1	1		
2	4	279.06	1116.24
3	2	302.13	604,26
4	4	291.79	1167.16
5	2	255.85	511.70
6	4	177.97	711.88
7	1		

4111.24
4.46 ⅓ the com. int. betw. Arrears.

2466744
1644496
1644496

Cub. ft. 18336.1304÷100=183 36-100 Tons. under deck.

Poop or other closed-in space.			
Viz.: None.			
Me. Lgth. ft.			
Com. int. btw. bths. ft.			
N. of Bths.	Multipliers.	Bths. Ft.	Pdts.
1	1		
2	4	.	
3	1		

⅓ com. int. bet. bths.

—ht. of space.

Tons.

Cub. ft. ÷100=

} closed in spaces, if any, naming them.

Reg. Tonge.

In the case of Steam Vessels, the measurements of the actual Engine Room, and the calculations for the allowance for the propeiling power, are to be given in detail on the back of the form.

* **Note.**—In the case of Steam Vessels, state if the Ship is of Iron, a Screw or Paddle Vessel, also her nominal Horse Power.

In the case of a Steam Vessel, the allowance for the propeling power, as calculated on the back of the form is to be deducted from the above.

Signed W. P. Skinner, Meas. Surveyor.
Examined by W. Moore, Draughtsman.

EPITOME OF RULE 1.

Length—Taken inside on tonnage deck (in all vessels under three decks, the upper deck is the tonnage deck; in all other vessels, the second deck from below), from inside of plank at stem to inside of midship stern timber or plank there (as the case may be); the length so taken, allowing for rake of bow in thickness of the deck, and for rake of stern in the thickness of the deck and one-third of round of beam, is to be divided into the prescribed number of equal parts (which determines the stations of the areas), according to the length as follows:

Class 1.—Length of	50 feet and under,	into	4	equal parts.
" 2. " above	50 to 120 feet	– "	6	"
" 3 " "	120 to 180	– "	8	"
" 4. " "	180 to 225	– "	10	"
" 5. " "	225 and upwards	"	12	"

Areas—Area No. 1 is at the extreme limit of the bow. Area No. 2 is at the first point of division of the length. The rest are numbered in succession, the last being at the extreme limit of the stern

Depths—Taken at each point of division of the length, or station of each area, from the under side of tonnage deck to ceiling at inner edge of limber strake, deducting therefrom one-third of the round of the beam; the depths so taken are to be divided into four equal parts, if midship depth should not exceed sixteen feet, otherwise into six equal parts.

Breadths—Taken at each point of division of the depths, and also at the upper and lower points of the depths. The upper breadth of each area is to be set down in its respective column in a line with No. 1 (left hand numerals), and the rest in succession.

N. B.—The number of columns for areas will vary according to the length, as in the classes above given, and will be equal to the number of parts into which the length is divided + 1.

Measurement of actual Engine Room,
and Allowance for Propelling Power.

Length from front of stem under bowsprit to back of head of post.	Breadth extreme from outside to outside of plank.	Depth at main hatchway from under side of tonnage deck to ceiling at the inside of limber strake.
108.5 feet	25.2 feet.	16.5 feet.

NOTE.—In the case of the re-measurement of Ships, the Tonnage under the late law as stated in the Register is to be here shown.

Reg. Tonge. under 8 & 9 Vict. cap. 89. } Tons.

And in the case of New Ships it is desirable to ascertain the Tonnage by girting, when the other indispensable duties of the Surveyor will admit of it. When this can be done the measurements and calculations are to be here subjoined, stating whether the vessel is full, sharp, deep, or shallow.

The second Formula furnished, is that of a measurement of the brig Friends. An error having been detected in the curve of areas, an order was sued from the Surveyor General's office for a re-measurement of the vessel, which was made, and the error corrected, as the following note from the Measuring Surveyor, with the engraving, will show:

TIDE SURVEYOR'S OFFICE, *Sunderland*, 9*th Augt.*, 1855.

"SIR—Agreeably to your orders I have re-admeasured the ship "Friends," and find the second breadth of area 6 to be 1-6 ft. short measured.

"The error was caused by the difficulty there was in getting the breadth through a bread locker, state-room, and captain's berth. The error is to the amount pencilled in by Mr. P., the draughtsman.

"I am sorry the mistake has occurred, and will endeavor to avoid such in future.

"I am, sir, &c., &c.,

"W. S., *Measuring Surveyor.*

"G. MOORSOM, Esq., Surveyor General, London."

Formula of Areas.

BRIG FRIENDS.

No. of Area.	Areas reduced to Scale.	
1	—	—
2	279.06 ÷ 20 =	13.95
3	302.13	15.10
4	291.79	14.59
5	255.85	12.79
6	*170.80	8.54
7	—	—

* Error. Corrected, ft.177.97 ÷ 20 = ft.8.9.

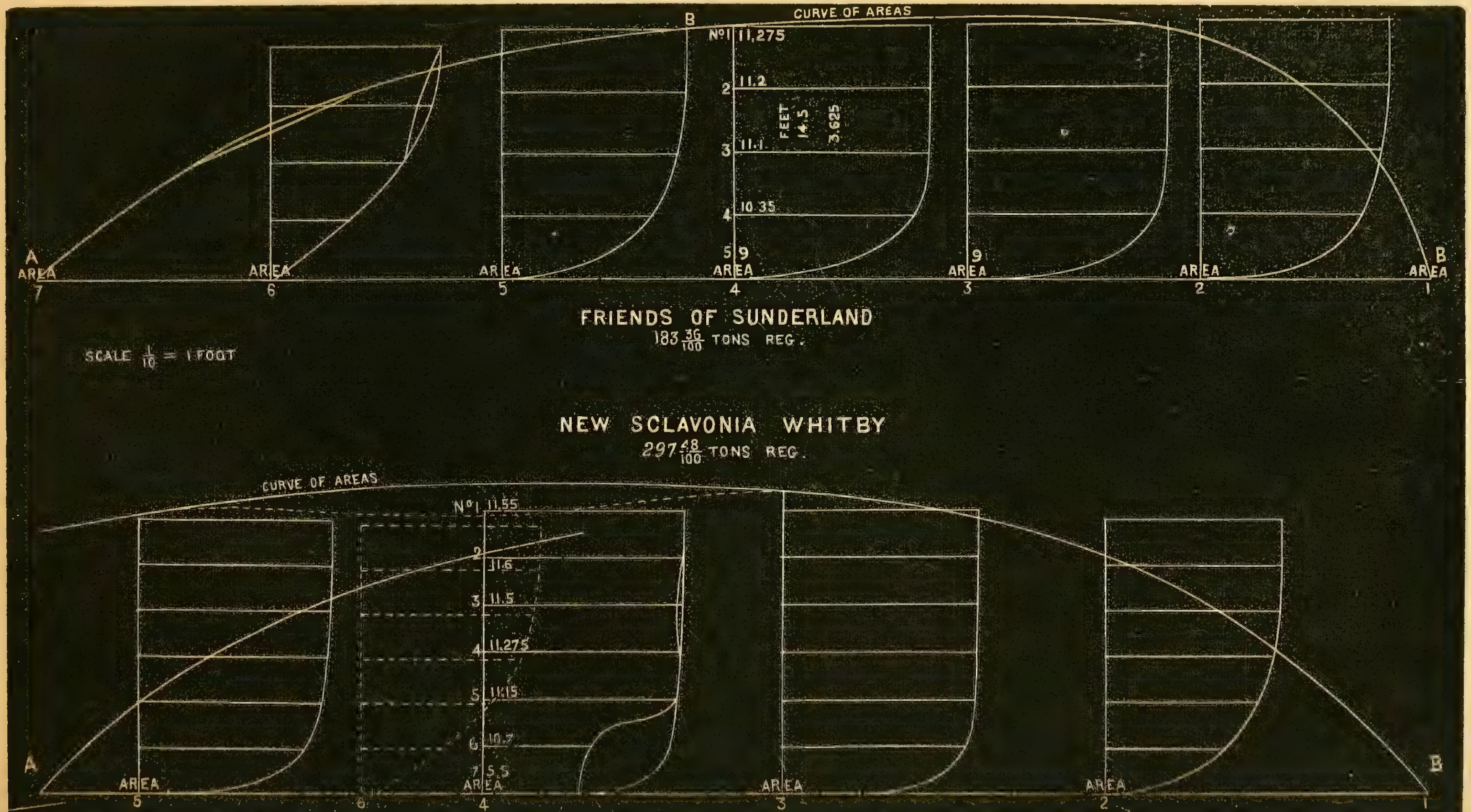
NEW SHIP SCLAVONIA,

No. of Area.	Areas reduced to Scale,	Ordinates to Curve of Areas.
1	—	—
2	271.92 ÷ 20 =	13.59
3	349.44	17.47
4	*323.32	16.16
5	320.23	16.01
6	236.81	11.84
7	—	—

* Error. Corrected, ft.357.90 ÷ 20 = ft.17.89.

REFERENCES TO DETECTIVE CURVES.

The *base line A. B.*, is the length of the ship at the tonnage deck, as set down in its proper place in the Formula. The *mark* (.) in the sections, is to show where wrong breadths were taken, and the extent of the error, and how easily it was detected. The same mark, in reference to the curve of areas, is deranged in its regularity of form by the error committed. This curve of areas is a reliable medium of detecting errors, and will take cognizance of an error amounting to only $\frac{1}{3}$ of a ton. Mr. Moorsom informs us that the knowledge of this fact by the measurers, throughout the united kingdom, has had such a moral effect upon them, that it is scarcely ever found necessary, comparatively speaking, to require re-measurement to be made. He further adds, that they now find the absolute necessity of some check of the kind, whatever rule of tonnage might be the law of the land,—he frequently having recourse to trying the measurements under the late law, where he has cause to suspect error has been practiced, and he is continually finding errors amounting to from 5 to 15 per cent., which have been introduced either by fraud or accident.


CURVE OF AREAS
B
No 1 11,275
2 11.2
FEET
14.5
3.625
3 11.1
4 10.35
5 9
9
A
AREA
AREA
AREA
AREA
AREA
AREA
B
AREA
7
6
5
4
3
2
1
FRIENDS OF SUNDERLAND
$183\frac{36}{100}$ TONS REG.
SCALE $\frac{1}{10}$ = 1 FOOT
NEW SCLAVONIA WHITBY
$297\frac{48}{100}$ TONS REG.
CURVE OF AREAS
No 1 11.55
2 11.6
3 11.5
4 11.275
5 11.15
6 10.7
7 5.5
A
AREA
AREA
AREA
AREA
B
5
6
4
3
2
1

The detective curves consist of two denominations of curves:—the one being the delineations of the sections of the ships measured, showing the practical breadths and depths taken at the ship—the other being the curve of areas of the ship, constructed from the areas computed by the measurer from the dimensions he has taken. The ships are measured at all the ports of the kingdom, as the case may be; but the detective curves are performed at the central or Surveyor General's office, in London, being transmitted to London for the purpose, on a formula used by the measurer in the practical operation, and printed in blank accordingly. These blank formulas are of seven classes, according to the length and depth of ships, as prescribed by the act of Parliament.

The explanation of the detective curves is as follows:—A. B., the base line, is the length of the ship, as shown in the formula at the tonnage deck. It is set off on a scale of 1-4 of an inch to a foot; the half sections of the ship, also on the 1·4 of an inch scale, are drawn in at their proper divisions of the length by means of the depths and breadths, shown in their respective columns on the formula. These curves prove how far the breadths are properly taken at the ship. But only the curve of areas can prove the depths, and also the correctness of the arithmetical computation; for the sectional curves might prove the breadths correct, but a depth notwithstanding, might be wrong, and also an error might be made in the computation; both of which latter would render the tonnage wrong, just as much as if the breadth were incorrectly taken. This curve of areas is taken as follows:—The areas on the formula, as computed by the measure, are divided by *10, 20, or 30, according to the size of the midship area, and the quotients are set off as linear dimensions on a scale of 1-4 of an inch to a square foot, on the respective middle lines of the areas, and a curve is passed through the points which gives the curves of all the areas of the ship, the extreme ends of this curve being at A and B, where the areas become nothing; that is, where the capacity or body of the ship terminates or ceases. Now, as all the areas of a ship form the fair body of the ship, this curve must form a fair or regular line; consequently, if one or any of these areas, taken from the formula, is greater or less than it ought to be, it shows itself by an anomalous line, and immediately directs the attention to its computation in the formula; but if this is found to be right, it is at once concluded that the depth has been wrongly taken, and the measurer is required to remeasure his depth accordingly.

This curve of areas constitutes a beautiful theory. The balance of the body of the vessel may be seen at once. In fact, the simple area or surface

* This division or reduction is done in order to bring the curve within measurable dimensions. It is found in practice that when the midship area is under 300 square feet, it is well to divide by 10; when between 300 and 600 sq. feet, then to divide by 20; and when above 600 sq. feet, then to divide by 30.

contained between the curve and base line, A. B., multiplied by the scale of 10, 20, or 30, on which it was originally reduced, is the real cubical contents of the ship; or the area of any part of it, drawn between any two lines perpendicular to A. B., is the cubical contents of that part of the ship situated between such perpendicular lines.

It may be well to observe here, that the persons selected for this duty of test and examination, are two practical ship-wrights, who are sufficient for this duty as regards all the *new ships* progressively building in the United Kingdom; but there are at present employed, in addition to these, in consequence of the remeasurement of old ships, which is rapidly being proceeded with, four other persons who have been instructed, who are the ordinary Custom House officers, on salaries of £70 a year. And with this staff the department of Her Majesty's Customs are enabled to draw the detective curves, and make every other necessary examination of every ship's tonnage, which takes place under the new law; and it is done so expeditiously as scarcely ever to miss sending back the attested formula by return of post. And in case of any sudden flow of remeasurement being called for, care has been taken to instruct ten other ordinary Custom House officers ready to assist in case of such emergency.

Mr. Moorsom has also been careful to provide a sufficient number of the same class, with the necessary instruction at the outports, to assist in the remeasurement of shipping in case of need. The new ships are, in fact, no consideration; as regards trouble, the old ships alone constitute any difficulty. But every thing is going on smoothly, and the entire commerce of the United Kingdom is being measured by the new law, which will afford the greatest encouragement for improved models to all their new vessels, seeing that they are to be registered for what they really are, and not as in the United States, for what they are not. The new law of England is the best that could be adopted. The allowance to steamers in per centage might be improved, but all that pertains to sailing vessels is well adapted to the wants of Great Britain, inasmuch as deck load transportation being prohibited by law, capacity is the only available mode of admeasurement that could have been devised, and is equally advantageous for the foreign Commerce of the United States.

But the displacement rule is equally applicable to the United States, inasmuch as a very large proportion of American Commerce is comprised of the deck loads of vessels. But the load line of flotation of which so much has been said, is not available for a rule of displacement, the entire displacement up to the gunwale is the only available rule. It is not an uncommon occurrence for a low decked vessel to carry a deck load equal to $\frac{5}{8}$ of the entire cargo, and the load-line and the deck line are at the same height. It must be at once apparent that, with the largest liberty to carry cargo in any and every part of the vessel, the law of capacity alone is insufficient for the en-

tire wants of the United States. But when we contemplate the adoption of both the law of displacement and capacity, we have a full sized impression of the wants of American commerce, and every vessel may be measured by the passage of both laws. The rule of displacement is even more simple than that of capacity, and may not only be registered at the department of Customs, but may be a framed drawing, hanging in the cabin of every vessel, showing the weight of the vessel at any line of flotation below that of sinking ; the true rules could be worked harmoniously together, and form an international law of admeasurement, the greatest boon that could possibly be conferred upon American commerce. In order that the working and appreciation of the new English law may be more fully set forth, we give publicity to a communication of a Ship-builder, taken from one of the leading English Journals.

To the Editor of the Shipping and Mercantile Gazette:—

Sir,—The measurement and deadweight cargoes of ships in their respective units of measure and weight could, for an average voyage, be estimated by a very short and simple process, from the present Register Tonnage of the Merchant Shipping Act of 1854. But before doing so, I will first simply say, in reference to the deadweight cargoes of ships—namely, that neither the load nor light lines of ships can be fixed with any degree of correctness, and that, according to the received opinions of both Ship-builders and Ship-owners, the weight cargoes of ships measured from such lines, merely arbitrarily assumed, could not be sufficiently approximated as to be regarded of any practical utility. It is on these grounds, I affirm, that the weight cargoes of ships can be more correctly ascertained by means of the present Register Tonnage, from the known average relation, variable as it may be, which exists between capacity and weight, than from any additional and laborious measurements and calculations connected with erroneous lines of displacement.

And secondly, in reference to the measurement cargoes of ships, I will also say, that the Register Tonnage of the Merchant Shipping Act, being the entire unvarying cubical contents of a ship expressed in tons of one hundred cubic feet each, is a more equitable standard for the payment of dues than either deadweight or measurement cargoes, which must be ever varying according to the length and circumstances of every different voyage. And I may here add, in reference to measurement cargoes, that when a ship is registered under the new law, these entire cubical contents, in cubic feet, are immediately known by simply adding two cyphers to the Register Tonnage—and this being done, that an owner can then without much difficulty make his own calculations, as he has only to deduct such number of cubic feet as he chooses to appropriate to particular services, and such further allowance as his experience teaches on account of stores for the voyage, and the usual obstructions to stowage, and he thus arrives practically at the number of cubic feet left for the purposes of cargo, and which he has then only to divide by 40, and he ascertains pretty nearly what his ship would carry for that particular voyage. This general property of the new law is the great advantage which it possesses over all other systems hitherto advo-

cated, and which any owner can avail himself of, under every varying circumstance in which his ship may be placed.

But for those owners and others (for whose information this present communication is more particularly intended) who may wish, without entering into the above details of each particular voyage, to readily ascertain from a ship's register tonnage her average capability for measurement and weight goods, the following short and simple process will be found to give respectively, in each case, a very useful approximation to the average cargo required.

1st. As regards ascertaining the average measurement cargo, at 40 feet to the ton, which a ship can carry: Take the number of register tons under the tonnage deck, which is shown separately in the ship's Certificate of Registry, and multiply it by $1\frac{7}{8}$, which will give the measurement cargo which the ship can carry under the tonnage, or what may be termed, the cargo deck. For example, it is shown in a ship's register that the register tons under the tonnage or cargo deck amount to 560—this multiplied by $1\frac{7}{8}$ gives 1,050 for the average number of tons of measurement goods, of 40 feet to the ton, which the ship can carry.

2d. As regards ascertaining the average deadweight cargo which a ship can safely carry: Take, as before, the number of register tons under the tonnage or cargo deck shown in the Certificate of Registry, and multiply it by $1\frac{1}{2}$, which gives a useful approximation to the average deadweight cargo which the ship can safely carry. For example, the register tons under the tonnage deck of a ship amount to 560, as before—this multiplied by $1\frac{1}{2}$ gives 840 for the average number of tons of deadweight cargo which the ship can safely carry.

It is to be observed, that the above results are termed average cargoes in each case. They are so termed, because it was necessary some length of voyage should be assumed, in order to determine what allowance should be made for the necessary equipment of stores, provisions, &c., dependent on such voyage, and an average length of voyage was considered to be the most eligible for the purpose. It hence follows, that on the short voyages, such as those of our coasters, particularly small vessels which are more buoyant in proportion to their capacity than large vessels, and for which the equipment is comparatively trifling, an addition of about 10 per cent. should be made to the results; while, on the other hand, in the case of the longest voyages requiring an equipment for 12 or 18 months, a deduction of about 10 per cent., particularly as regards large vessels, should be made from such results.

As a proof how far these two short methods of arriving at the respective cargoes which ships are enabled to carry may be useful, the subjoined table has been constructed, exhibited in columns 4 and 6; the measurement and dead weight cargoes actually carried by several ships named in column 1; and in colums 5 and 7 exhibiting their cargoes, estimated respectively in the manner proposed:

Ships' Names.	Nature of Cargo.	Reg. Tons under Tonnage Deck.	Measurement Cargo. 40 feet to the ton actually carried.	Measurement Cargo estimated at $1\frac{7}{8}$ of Reg. Tons under Tonnage Deck.	Deadweight Cargo actually carried.	Deadweight Cargo estimated at $1\frac{1}{2}$ of Reg. Tons under Tonnage Deck.
		Reg. Tons.	Meast. Tons of 40 feet.	Meast. Tons of 40 feet.	Tons Weight.	Tons Weight.
Edinboro' old Indiaman	Miscellaneous	Und. Mid. Dk. 1086	—	2036	1600	1629
Ailsa, belonging to Mr. Gilmour.	Miscell., outward bound, Indian Corn inward	1232.59	2,193	2,311	1849.84	1848.88
Alexander	Miscellaneous	560	—	1,050	874	840
Columbia	Sugar	283	544 in hhds.	531	422	424
Triune	Coals	217	—	409	340	326
Gem	Oranges	69	126 630 boxes 5 to the 40 feet.	129	105	103
Liverpool (schooner)	Salt	64	119	120	104	96
Deben (sloop)	Barley	60	103	112	96	90
Castle Baynard (Copper Miners' Company)	Iron	59	—	$110\frac{1}{2}$	95	$88\frac{1}{2}$
Ann (sloop)	Stone	22	—	41	31	33

Finally, the rationale of selecting $1\frac{7}{8}$ and $1\frac{1}{2}$ as the factors for educing the respective cargoes from the present system of tonnage, as set forth in this communication, is briefly explained as follows:—

1. As regard $1\frac{7}{8}$, the factor of measurement cargoes, the most experienced ship-owners, and others practically engaged in the stowage of ships, state that for a voyage of average length, 25 cubic feet out of every 100 in a ship's capacity may be deducted for the services of the crew, stores, provisions, and other abstractions from cargo space, so that there will remain only 75 cubic feet instead of 100 in every register ton available for the purposes of cargo;—consequently, if we divide 75 by 40 it gives $1\frac{7}{8}$ for the number of measurement tons contained in a register ton; or, in other words, if register tons are multiplied by $1\frac{7}{8}$, we arrive at the number of measurement tons contained therein.

2. As regards $1\frac{1}{2}$, the factor for deadweight cargoes, it is known from experience that there exists a certain relation (necessarily a variable one, though probably less variable than the deviations of assumed lines from the true lines of flotation), between the internal capacity and the deadweight which ships can carry. This relation is, that there are on an average of ships about 67 cubic feet in the hold, for every ton of deadweight safely carried, supposing such ships to be stored and provisioned for an average length of voyage. If, therefore, the register tons contained in the hold of a ship be brought into cubic feet and divided by 67, it will give approximately the number of tons of deadweight cargo which the ship can carry on an average length of voyage. But this is the same process as simply multiplying the register tons in the hold by $1\frac{1}{2}$. I am, sir, your obedient servant.

City, March 29, 1856. A SHIP-BUILDER.

HISTORICAL SKETCHES OF SHIP-BUILDING.

[*Concluded.*]

SEVERAL attempts have been made in England to enlarge the measure of scientific knowledge possessed by naval architects in that country. One was the founding of a society, in 1791, for the improvement of Naval Architecture, which originated in the exertions of a patriotic bookseller, and numbered amongst its members, many noblemen and gentry of *rank*, as history relates. No *Mungo Murray* took part in their deliberations, nor did any genius for the age come to light among them all. King William IV., before the date of his coronation, presided in the chair. It did not occur to this royal conclave, that ship-builders were likely to know more about building ships than booksellers or princes—an idea that has scarcely become universal even in the light of the present day.

At a later period, more correct notions prevailed, it having occurred to some practical mind that the true path of progress in naval architecture lay in educating ship-builders. In 1811, an effort was made by the British Government to improve the qualifications of constructors and foremen in the navy-yards, deeming it essential to the stability of the kingdom that better ships should be built to constitute her fleets. A school for naval architecture was established in Her Majesty's Dockyard at Portsmouth, in consequence of a report from a committee on naval revision, which stated that "many of the shipwright officers in the Navy were deficient in a common education, and no care had ever been taken on the part of the public to provide that they should have any instruction in mathematics, mechanics, or in the science or theory of marine architecture." In the course of 21 years forty-two students were educated at this establishment; three only have been promoted to a step above that of foreman. Prejudice has baffled their aspirations for usefulness, and virtually deprived the nation of any benefits arising from their superior attainments. The British Admiralty continues to disregard the qualifications of candidates for promotion, and refuses to advance a member of the school to any important post. The "customs of the service" are too strong to be set aside. The present surveyor, (or chief constructor) of the British Navy, is a favorite *naval* officer, who has no practical knowledge of ship-building, having earned his title to distinction and favor outside the pale of mechanical operations. The school of Naval Architecture, through the writings of its members, has had a marked influence upon the marine architecture of Great Britain, (and we may add this country also,) notwithstanding it has so signally failed in the main object for which intended. It was abolished 24 years ago, after educating some of the mechanical minds of the kingdom.

From the marine history of Europe we shall turn to North America—for-

saking the old world for the new, and stupid adherence to precedence for fearless pioneering skill.

The western world, itself, was discovered by no timid conservative, pushing the world backward in his harness. Its discovery resulted from boldness of enterprise—from the free play of maritime intuition, and the zeal arising from speculative dreams. Its people have subsequently distinguished themselves for bravery, enterprise, and speculation. Wherever peace has planted her prosperous foot, commerce and navigation have made their home. Ship-building has flourished under the culture of genius alone; no royal exemplars, or *naval* patterns, has ever cast rays of sunshine upon the ship-yard and the ship in these States, and yet the Yankee navigator, as expert at hauling fish as whittling out " notions," commands a steamship, or sails a yacht a *leetle* ahead of all creation. The working shipwright's boy whose imitative skill directed schoolmates in planning shingle boats, or excelled in carving miniature vessels for holiday sports, has in this hemisphere modelled his advancement to fame, by pursuing in art the very amusements of his youth.

Old Europe itself becomes young when transplanted in western soil. She bows to the destiny marked out for the golden point of compass, to which greatness rolls its empire.

The maritime history of the United States is rich in the successes of our art. With every increase of our population we have experienced commercial growth. Every town settled in the forest adds a ship to our marine; every county sets in motion a steamboat; and each new State demands a line of steamships as a wedding gift. Not only so: the self-taught North American, from Quebec to New-Orleans, has become the world's ship-builder, for monarchs and merchants of Europe have alike made a ship-mart of America.

We shall reserve to a future occasion more minute sketches of the progress of ship-building on the shores of the New World, when we shall endeavor to do justice to every particular locality.

The United States and the British Provinces accomplished but little in the way of ship-building, until after the American Revolution, and the opening of the 19th century. Prior to 1770, regular packets were established between Boston and Falmouth, Eng.; and between Providence and London a considerable trade existed; but the chief commerce of the New-England Colonies, was with the West Indies. New-York traded mainly to Great Britain; Pennsylvania to the South of Europe; and the Carolinas to Great Britain. New-England exported largely to Africa, while the Carolinas received the return cargoes. At that time—75 years ago—the commerce of these two Southern States equalled that of all the New-England States together; it was more than double that of New-York; and exceeded that of Pennsylvania by one third. In 1792 the exports from New-York

was valued at 2½ millions; from Pennsylvania 3,820,000, and from Charlestown alone 3,834,000 dollars. From this period the commerce of the South fell short of that of the North, and Charleston, S. C., which was then the metropolis of the New World, became a city of merely local importance. The cause of her decline is found primarily to result from improvements in navigating vessels from Europe bound to the Northern States. Before a knowledge of the Mexican Gulf Stream became general, an d Dr. Franklin had discovered that the approach to the American coast could be approximately ascertained by means of the water thermometer, all vessels took Charleston in their way in sailing from Europe; and, strange as it may now seem, that Southern city was then the half-way port of European trade. In winter the ports of the North had been deemed inaccessible, except by approaching from the South. After the decline of Charleston, Philadelphia led off as the metropolitan city; her career was brief, however; the construction of the Erie Canal, and the settlement of the West, decided the title of New-York to the first in commercial greatness among American cities. The strong arm of the West and the commerce of the Lakes, have ever since furnished her with the arm of metropolitan strength.

During this period a limited amount of ship-building was done in this country—the small vessels of our fishing and coasting-trade being the chief that were built. The foreign commerce was mostly prosecuted by home-built ships.

It is only thirty-five years ago since the New-York merchants established sailing packets to Liverpool, which constituted her first grand step for the mastery in trade—upon this basis of success she steadily advanced. The steamboat had become established upon the Hudson, and thus the products of land and sea flowed into her lap.

Baltimore became famous for her ship-building in the second war with Great Britain, having produced the swiftest fleet of privateers that ever went forth upon the ocean, scarcely one of them being captured by the enemy, and upwards of forty having been sent to sea. They were very properly denominated "clippers" by the enemy, who never could reach one in sufficient force to make a capture, but on the contrary, had good reason to come down to the naval skill hailing from Baltimore. The African traders of this port were not less eminent in their day.

Massachusetts is, however, the oldest ship-building State, and the old-fashioned Indiamen of Salem possessed a substantial character. It may, however, be said, that New-York has for forty years led the van of improvement in models of marine architecture, inasmuch as her position at the head of commerce placed her, also, at the head of ship-building, to a certain extent.

To the invention of the steamboat we owe much of our national impetuosity and passion for rapid navigation; and New-York mechanics being called to shape the swift-running boat for river use, began at length to

dream of placing steam bottoms under canvas rigs, and to ply the ocean with ships for speed.

It was soon seen that the builders who most excelled in steamboat construction, for the rival ridden Hudson, could build the swiftest ships in the China trade. From north and south, marine architects looked to New-York for models, and new fashions in finishing ships. With the advent of ocean steam navigation, New-York builders entered upon a career of improvement, which will date an era in the history of nautical architecture. In their efforts they have far surpassed all former achievements in history. As in the steamboat—the criterion of speed upon the waters—so in the steamship, the sharp bows of the vessel indicated an increased per centage for profit on the merchant's ledger.

The discovery of gold in California followed. Old full built ships sailed in scores for the golden land, never to return. The vast improvement in marine architecture, which followed this movement of our people, may best be estimated when it is known that the ships of double and treble the tonnage of the pioneers in the trade, were rapidly launched from the stocks, so improved in model, as to be capable of performing the very same voyage in one quarter and one-third less time. But while the construction of ocean steamers almost absorbed the attention of New-York, Boston soon assumed the lead, not only in the speed, but the magnitude of her "clipper" ships.

Meanwhile Philadelphia had established a reputation for steam screw propellers, having built more of this class of vessels than any other sea-coast city in the Union.

But the most famous ship-building State has yet to be named—it is Maine, the greatest maritime State in the world. Marine mechanism is the main manufacture of Maine.

The same remark might have once been applied to the British Province of New-Brunswick. The ship-yards of England have been transferred to Lower Canada and New-Brunswick, for, at least, 25 years past. Nor would it be unfair to say, that in model, workmanship, and magnitude, the ships of Maine and these Colonies are equal to any built elsewhere, even in the more favorite localities. An unworthy prejudice too often prevails against the productions of country mechanics, as builders have been denominated, beyond the environs of the great seaports. Experience teaches the observer, that men and things are the same wherever found; and that it has been the mistake of mankind to magnify time and place, and not to appreciate actions and men for their abstract and intrinsic worth.

INEFFICIENCY OF THE NAVY.

REPORT OF THE NAVAL BUREAU OF CONSTRUCTION, EQUIPMENTS AND REPAIRS.

THIS branch of the public documents prepared for Congress, has just been received. It sets forth the *material* of the Navy as deplorably "inefficient." Had the Chief of the Bureau extended the information he so sparingly imparts, it would have enabled Congress to determine the real condition of the Navy; which the report in its present shape fails to furnish. Whatever may be said for or against the maintenance of navies, it cannot be denied, that it might be properly regarded as one of the fruits of an advanced stage of civilization, to limit the naval armament of the world by treaties, to a peace complement. No nation could furnish stronger reasons for such treaty stipulations than the United States, notwithstanding she possesses the largest commercial intercourse, and widest range and extent of sea-coast of any nation on the globe.

Beyond a peace complement, the Navy, like the Army of the United States, under the present form of government, will always be found to be commensurate with the demand; and when needed, we shall have the largest Navy in the world. Of this the people of England had the most indubitable evidence in the war of 1812, by the destruction made of British commerce by American private-armed vessels, the right to use which, will be abandoned by the American people, at the same time that they acknowledge the right of search. That we need a Navy no friend to this country can doubt. But let it be an efficient one; let it at least keep pace with the improvements of the age; let it be such a Navy as shall bring honor and not disgrace upon our flag and be a libel upon our institutions.

The report before us furnishes the intelligence that there are the frames of 35 vessels on storage, in the several navy yards, but not one word is said about the models of those vessels, 11 of which are ships of the line, not unlike those six afloat and four on the stocks, which would be an incubus to any Navy in their present form, all of which are kept at home and on the stocks for the best of reasons, "inefficiency" in all the essentials of a war-vessel.

The report is not only silent upon the models of those vessels, made by, or under the direction of the Navy Board of Commissioners, but actually advises their construction. Why does the Chief of the Bureau tell Congress that there are two millions seven hundred thousand cubic feet of timber, and sixteen thousand knees, required to complete those vessels, while he very well knows, or should know, that if they were built, they would be a burning disgrace to the Navy and to the country? Would he lend his influence by such a blind-folded report, to have those vessels built, and then avoid responsibility, by coolly telling Congress that the Bureau cannot be held responsible for the performance of vessels it did not

model? The chief very well knows that the scantling of those frames is but a single inch larger than the size required when complete, and in the vessel; this inch allowance is for imperfections in moulding and bevelling the timber, quite small enough to secure the intended shape and correct bevel. Well does the chief know that no material alteration in the models of these vessels can be made, without rendering the timber useless for the parts and purposes for which intended. The idea of modelling a Navy for generations yet unborn is ridiculous and absurd.

It would be a safe deliverance, to use the most appropriate parts of those frames for the new steam sloops-of-war. We often hear it said that Naval Constructors are trammelled so much by commissioned officers of the higher grades, that they cannot improve—they cannot do what they would. This is true, as we shall show in its proper place. But what commissioned officer induced this report of the Bureau of Construction? Let him be named and dropped from the list, retired, furnished with leave of absence, or sent to sea,—anywhere to rid the Bureau of his pernicious counsel. The Chief Naval Constructor of the British Navy is a commissioned officer,—perhaps it was he. Who can tell? The report further informs us, that foreign services are still building very heavily armed ships, propelled by steam, carrying guns on several decks, and then the Chief tells Congress that the frames of our ships of the line are well adapted for similar vessels. Does he mean by this, that foreign services are now designing those vessels carrying guns on several decks, or that they are merely finishing those already on the stocks, to make room for more efficient construction? Is not the latter the more probable? It undoubtedly is; and may we not name the exceptions to be such vessels only as can attain an average speed of 9 to 10 knots per hour,—a speed to which there is not a frigate in our Navy having the old model, can attain, much less a 74. But this is all easily accounted for; the chief has a strong attachment for the antiquated. Relics of precious old models are better than new ones for him. If any one doubts, let him visit the navy yards, commencing with Brooklyn; look at the hulks repairing and repairable: for example, the steamer Mississippi, that will cost nearly as much as to build a new one. There is not a nautical mechanic in the United States who can fill the position with credit to himself and to his country, who will not say that the Mississippi should be lengthened at each end. But we need not go farther while we have the report before us. By turning a leaf we find that there are six of this same class of vessels that the Chief recommends, viz: ships of the line now in ordinary, and four more on the stocks. Now, why not send these to sea, if they are the best and most efficient size? Of the frigates we have nine in ordinary, repairing and equipping, and only four in commission; and of the sloops-of-war, there are 14 in commission, and only 5 in ordinary and undergoing repairs—a pretty sure indication that the sloops-of-war are the most efficient class of sailing-vessels, while the Chief recommends build-

ing ships of the line. Of brigs there are but two in commission and one in ordinary. Of steamers there are in all 15, exclusive of the six new ones; of these five have been purchased, four of which are mere tenders, 12 in commission, and five on the sick list in ordinary. If additional evidence of the "inefficiency" of ships of the line were necessary, we have the Franklin for reference, once a 74, then razeed to a frigate, and now an auxiliary steamer, in ordinary. There is one bark, one schooner, and seven store-ships in commission, making a total of 68 vessels, exclusive of those on the stocks, and the five unfinished steamers; of these 32 are engaged in actual sea service. This report should be referred back to the Bureau for correction and details, and that advisory counsel—whether American or English—dismissed.

RUDDERS.

In the first number of volume four of the U. S. NAUTICAL MAGAZINE and NAVAL JOURNAL, we published an article on the efficiency of Rudders—subsequently we received a communication, purporting to be an exposé of the instability of our position in the article referred to, demonstrated by experiments the writer had made. We gave publicity to the article in connexion with the accompanying diagram, in the April number of the present volume, followed by a few remarks which we deemed pertinent in reply. We have received another communication from the same source, which was unavoidably crowded out of the last number. We invite the attention of mechanics and nautical men to the communication in question, and to such remarks as may follow.

The writer would have us produce *facts* in confirmation of what we have said. To show his faults in such manner as to make them self-evident, and make the subject comprehensive to an ordinary mind, must suffice for us. It cannot be expected that we should write a treatise on the laws of resistance, in order to disprove his position; but it will not be deemed necessary by the intelligent reader, who is at all familiar with mechanism or nautical pursuits.

MESSRS. EDITORS:

GENTLEMEN:—I own to some little surprise in perusing your reply to my communication in your April number, you having drawn an inference from my statements altogether different from what I conceived the language warranted, very different from what I intended to convey, since it differed from the fact; my experiments being with an ordinary vessel. My statement was "two rudders, one on the bow and one on the stern," and the diagram shows the same; the only difference between the statement and diagram is, that the rudders on the diagram are so placed, that they act in unison with each other, and consequently tend to the same result;—the

diagram being given to illustrate the *philosophy* of the fact before stated, viz: that a vessel was more sensitive to the action of a rudder at the stern than at the bow:—while my statement was given to embody the idea, that the rudders were placed "at opposite angles" *opposite in their action*, and would, if hung to stem and sternpost, be on the opposite sides of the vessel. I apprehend that my saying the rudders were placed at opposite angles, led you into the belief that the diagram illustrated my idea of opposite angles, which was not the case. I suppose I should have been better understood, had I said *parallel to each other*, thus opposite in action.

Your conclusions do not strike me as conclusive. You observe "the stability of our position has not been disturbed, inasmuch as we contemplated a vessel with only one bow and one stern." As my "counter fact" was obtained by such a vessel, and its philosophy given in support of it, it does seem to me that your position is disturbed, if it is understood that "our position" means the opinion, that vessels are more sensitive at the *bow* than at the stern, to the rudder's action; which is what I take it to mean. But you observe that, the reason why my counter fact is of little value, is because I "hung the rudder by the wrong edge." Now I think this a singular if not a hasty decision. It is singular, inasmuch as I did not state how I did hang my rudders; and hasty, because it would be rather a difficult matter, I apprehend, to show the difference between the action of a rudder hung at the stern, and one whose axis was elsewhere, the remark applying to the fore rudder. Further, you remark, "inasmuch as his premises are false his conclusions must be equally so:" While conclusions that are based upon false premises, must necessarily fall when the falses upon which they are dependent are removed, I am not prepared to admit that, which gives importance to the sentence; before doing so, it is well to ask whether, that which I submitted come under that catagory, viz. false premises. I submitted a fact,—which certainly requires different treatment—that fact is disputed upon two grounds, first, that the vessel had two heads and two sterns, and second, that I hung my rudder by the wrong edge. The first is a wrong inference, drawn, I suppose, from an expression, as shown above; but which, had it been so, would not have changed the character of the fact one iota, because if *one* rudder obtains an advantage *from its position* over another differently situated, so would *two* or *two hundred so circumstanced.* The second is on a point—which I think of questionable importance—which is asserted to be so, without any proof that it is, and which in fact *was not hung by either edge*, its axis being at three-sevenths of its width from its fore edge.

To satisfy me that the fact I obtained was the result of another cause than that to which I have attributed it to, needed some statement of *facts* of an opposite character, and their *philosophy*, to help me to the conclusion that I have been thoroughly mistaken and deceived in my experiments. If they can be furnished, I shall be truly obliged; if they cannot, I must hold my present opinions despite the assertion that they are false.

You call in question also my opinion relative to large rudder surface, and ask me "to reconcile" it with some facts that you are acquainted with; you then present a fact, where a rudder was reduced one-fourth and was more effective, *having its sides hollow* instead of straight.

Allow me to observe that I see no reason to change my opinion from this fact thus presented; because in the first place, although the rudder was reduced in size, and would, according to my view, be less effective,—it had its sides hollow, and would thus become more effective, so far as the evolutions

were concerned; that is, the vessel would be more sensitive to its movements than if it were evensided, so far as the angles were measured by the *tiller* or its *centre*; because the water would readily close in with the concave sides to the centre of the hollow, being in fact only a continuation of the vessel's lines—except the lowest—for there is no abrupt change to occasion in the least degree a tendency to a vacuum or dead water; but from the centre of the concave side or hollow to the outer margin of the rudder, the lines are such that, the water passes out with some difficulty, and the effect is the same, as if the rudder was placed at an angle corresponding with the angle subtending from the centre of the hollow to the after edge of the rudder. Thus, when the rudder was parallel to the keel, it would stop the vessel's progress in proportion to the extra amount of friction occasioned by its concave sides, and the dead water occasioned by its wider after edge; but when at any angle to the keel, it would be more sensibly felt by the vessel than a straight sided rudder of the same size, for the reasons assigned above.

But in the second place, rudders' efficiency depend so much upon their *controllability*, and large ones cannot be so readily managed as small ones, as at present constructed; hence their inefficiency is not justly charged to them, but rather to those who cannot apply their force to advantage. I conceive a rudder to be controllable when the helmsman can command its movements readily from 45° on one side to 45° on the other, under all circumstances, which cannot be done with the rudders now in use, unless reduced beneath the size required for efficient action.

What reason can be given for the vast difference, in point of time, between the evolutions of large and small vessels, stronger than the fact that the larger the vessels the smaller in *proportion* are their rudders? It may be urged that "large bodies move slow." In a circle they assuredly do, and the smallness of their rudders is, I believe, the chief reason. Because it takes more time, as now used, to bring a large rudder to any given angle, than a small one, it is declared less efficient; because a vessel does not describe the segment of a smaller circle than the angle of the rudder will warrant, it is repudiated. Vessels are not governed by the *pilot's will*, but by the *rudder's force*.

In confirmation of the value of wide rudders, I will draw a comparison between the action of wind and water, which, I think, will illustrate the subject, being, in fact, that which was the basis of my philosophy, the precursor of my experiments.

The action of wind upon vessels' sails is here taken as the true exponent of the action of water upon rudders.

All the propelling power of a sailing craft is derived from the action of wind upon the canvas spread to receive it. Thus if one vessel has a greater area of surface spread than another, everything else being EXACTLY alike, the one that has the largest surface will move the swiftest.

And as the rudder derives all its power or efficiency from the action of the water upon its surface, and its power is measured by the area of its surface, and the force or velocity with which the water strikes it, in the same manner that the force of sails depend upon the velocity with which the wind comes in contact with them, the angle of contact being in both cases always the same, it follows as a necessary consequence that a large rudder surface has greater power to force a vessel round than a small one, and that its power increases from 0° to 45° in the same manner sails do; the differ-

ence between them commencing from that point, the sails increasing in power up to 90°, while the rudders decrease in the same ratio.

I close with the reassertion, that the desideratum is, that rudders can be increased in size, without increasing the resistance to be overcome by the pilot.

Yours for progression, R. W——.

BROOKLYN, E. D.

Indeed, we regard his position as still more inexplicable than we could possibly have supposed. Does the writer mean to tell us that he made his experimental trip referred to upon an ordinary sailing vessel, without a transposition of spars and sails? We assumed that his experiments were made on a ferry-boat, because we supposed that no one would so far transcend the limits of an ordinary share of discernment as to place two rudders on a sailing vessel at the same time—one on the bow and the other at the stern—with all the advantages of sail and inequality in the weather, and lee lines of flotation favoring the rudder at the stern. It appears by his own showing that, although he set out to test the best position for the rudder of a vessel, he neither determined that, nor yet anything else of value to himself or to the commercial world, and leaves the matter with us to find out what he did do, for he has not told us; as he leaves the matter, he placed the proclivities of the lee bow to come to windward, with the sail to help it, and the rudder at the stern also to favor it, against one rudder at the bow of the same size. If there ever was a demonstrative trial more completely one-sided, we are ignorant of the fact. But the writer would like to know how we determined the rudder was hung by the wrong edge. This was no difficult matter; and we say that, if his diagram is correct, we shall insist that the rudder on the bow was hung by the edge next to the stem, or else it was not hung in line with the centre of the vessel. We leave him on this point, to make choice of the wrongs.

But he would like to know of us how we knew the results of hanging a rudder on the bow by the edge next to the stem;—from the simple fact, that a receiver of water becomes more sensitive than a discharger, because less disturbed; besides, we know that rudders are designed to give direction to the vessel, because of the angle they present to the passing fluid; but if the rudder was hung by the edge at the stem, there would be but one side to it, and that the weather side; the lee side would, with the lee bow, form a reservoir to hold, rather than to give direction to, the current of water formed.

In relation to the basis of our correspondent's theory, which is such as he gathers from the propulsory power of wind upon the sails of a vessel, we may only remark, that we might show him one fact, at least, that he will probably admit. The weather leech of a ship's topsail is much more effective than the lee leech. But why draw his inferences from air instead of

water? The writer certainly must know that the distribution of buoyancy upon a vessel is as wide from that of propulsion as it well could be.

In our first article on rudders we undertook to show that, inasmuch as large rudders were both unmanageable and inefficient, the division of the rudder, as represented in the accompanying engraving, being divided, was more effective and perfectly manageable, and the facts were there brought forth to prove what are stated in certificates from those who had witnessed its performance. We showed, in the course of our remarks, that rudders would be more effective on the bow than on the stern, but being more inconvenient, and so much more liable to damage, on the bow, they were placed on the stern. Our friend, instead of disproving our position, has only confirmed it.

WIRE ROPE.

Paper read by Mr. Wm. Henry Wallace, before the Mechanics' Club of the American Institute, Wednesday Evening, April 23d, 1856.

As society has advanced in knowledge, and men have become more familiar with the natural mineral resources at their command, attention has been given to their fullest development; and thus we find there is a steady, yet progressive action continually going on to supplant the vegetable by the use of the mineral. And nowhere will this be found more general than in the application of iron in our times, to almost all conceivable purposes. It is not alone left for railroads, steam-ships, telegraphs, and naval armaments to consume this valuable product, but in these parts at least, we draw largely from it for our dwellings, ware-houses, public buildings, railroad station, &c., and each year as we advance in our experience, the demand becomes greater, until we are most ready to accept the proposition of a great English writer and political economist, that the civilization of a community is in direct proportion to its consumption of iron.

I leave these general ideas, however, to dwell more particularly, though briefly, on iron as manufactured into ropes, and purpose showing some of its advantages in this application.

Rigging.—As shipping generally furnishes the greatest market for the consumption of rope, I will endeavor to compare the wire rope with the hempen, and show some points wherein I conceive lies its superiority for this purpose.

You will please note, I refer entirely in this paper to *standing*, not *running* rigging. One advantage I will proceed to say, is, that wire ropes of equal strength with hempen, are but one fourth part as bulky; from which I argue, that the sailing qualities of the vessel must be improved just in the proportion that the surface exposed against the wind is decreased. For ex-

ample, the main stay on a steamer of 3,000 tons, if made of hemp rope, would require to be 12½ inches in circumference, whereas, if made of wire rope, the size of same stay would be decreased to only 5 inches circumference. This advantage would be appreciated on a vessel having auxiliary steam-power when making way against the wind.

Another advantageous feature, and of still more importance, is the great economy in weight, being about *fifty per cent. less.* The standing rigging of a steam vessel of the same size as before, 3,000 tons, from her shrouds and stays on her lower mast, including those of top-masts, top-gallant-masts, royal masts, and jib gear, would weigh, if made of hemp rope, 12.74 tons, while if made of wire rope, and same strength, the weight would be reduced to 8.24 tons, leaving a saving in favor of the wire rope of 4.50 tons; and in a sailing ship of 1,300 tons the saving in weight would be about the same. This large saving in weight, when it is remembered that the average of th standing rigging is placed above the centre of buoyancy, must naturally increase the *stability*, and particularly the *steadiness* of a ship. And this comparison will hold good in smaller classed vessels, as in an 80 ton yacht, the saving would be about .50 of a ton.

Another point I would offer in its favor, but one however, in my experience with nautical gentlemen, I find there is an unusual difference of opinion, is that while some maintain *the greater elasticity the better*, others hold that the *less elastic* the rigging, the better display the vessel has for her sailing qualities.

This question, I think, has been clearly settled in favor of the latter, in the published experiments made by Messrs. Newal & Co., of London, where well seasoned hemp, and wire shrouds, of equivalent strengths, under strains equal to one-third that which would break them, or more than they are usually exposed to. These experiments show that while the *stretch* or permanent lengthening of the wire rigging is nothing compared with that of hemp, *the difference in springiness is not more than one inch in favor of hemp in the longest shrouds*; practically, therefore, the less elasticity of wire rope can be of no importance. And again, by the use of turnbuckle-screws at the end of shrouds and stays, in place of lanyards and dead eyes, the slacking or tightening is accomplished with much greater facility and readiness, saving thereby a great deal of labor.

It has sometimes been suggested by those who have not given due reflection, whether there was not more danger from lightning in using wire rope than hemp. Now, whereas, if the bulwark irons holding the shrouds are extended to the copper, every wire shroud will become a lightning conductor, as may also be the case with the stays, so that the vessel is rendered perfectly proof against lightning.

For our naval vessels especially, wire rope is decidedly preferable, not more on account of its greater safety from fire than from the enemy's shot;

and these two points alone are of sufficient importance to call for a careful consideration of the subject on the part of our Naval Bureau of Construction. Here our English friends are in advance of us; its introduction having been made in the Royal Navy, over fifteen years ago, and its adoption steadily followed both in the Navy and by the mercantile marine service, down to the present time. The steamers "Bosphorus," "Himalaya," "Parana," "Oronoco," "Bengal," "Simba," "Atrato," "Emu," and "Persia," being among the last having more or less of their standing-rigging of wire rope.

I will take the liberty of reading to you an extract from a paper read by Mr. Andrew Smith, before the Mechanical Section of the British Association for the Advancement of Science, at St. George's Hall, Liverpool, in September, 1854.

"In the year 1848, the British Navy had in commission, 376 ships of every class. The expense for hempen rope standing-rigging for the above number of ships, (hempen rope being at the rate of about £40 per ton,) amounted to £114,330. In consequence of wire rope being more than twice as strong for the same weight of hempen rope, the cost for the standing rigging of the above number of ships, made of wire rope, amounted to about £86,000, thus showing a saving of about £28,000, for one outfit of the Royal Navy; at that time wire rope was £60 per ton."

As there are now more than double the number of ships in commission, and the price of hempen rope is also doubled £80 per ton, the cost to the country for an outfit of standing hempen rigging would be £914,640.

Wire rope, on the contrary, is reduced to £40 per ton, instead of £60, as in 1848. The use, therefore, of wire rope instead of hempen, would effect a saving, in one outfit for the whole Navy, of £157,320.

Beyond this the wire rope is much more durable. Speaking from the experience of twenty years, it may be taken as three times more durable; in fact, unlike hemp, the older the wire is the stronger it gets. Several ships in the Royal Navy, have been fitted from 15 to 16 years with this rope, and it is now as good as when first put over the mast-head. Hempen rope in the Royal Navy, is fitted every three years, or every time the ships are put in commission. In the port of Liverpool a great number of vessels have been fitted with this rope in about 15 years; consequently, if it is admitted to be three times more lasting or durable than hempen rope, there would be a saving effected in three commissions, or nine years, for the standing rigging of the Royal Navy, of £1,371,960.

As enormous as the aggregate saving may appear when the comparison is applied to the *Royal* Navy, I will venture the assertion, that an equally economical *pro rata* result will be arrived at when the comparison is made with *our own* Navy—and I regret that I have not been able, in the brief and peri-

odical leisure I have had to devote in preparing this paper, to obtain data and make the comparison.

The foregoing, however, will answer the present purpose of showing the economy of the wire rope, in the point of wear.

Here, however, the difference in cost between the hemp and wire rope would not be so great. The great disparity in England being, I suppose, partially attributable to the late war with Russia. Again, wire rope, unlike hempen rope, is not affected by the sudden changes of temperature: as in a northern climate, where tarred rigging gets hard, unyielding, and brittle, or under a tropical sun, where the tarred rigging becomes soft and flows, giving thereby great annoyance. Neither is it liable to those sudden changes in length, to which hemp rope is subject, and which, as every sailor knows, gives rise to inconvenience, and great labor in setting up the rigging, and to serious accidents, when, as often happens, the change takes place in a single night, in circumstances that render it impossible to set up the rigging before trouble has ensued.

I have endeavored at some length to call your attention to this field for the application of wire rope, not only because the great bulk of ropes manufactured are for this purpose, nor alone from the fact that its advantages are so numerous and well sustained abroad; but because its manufacture in this country is of modern date, and its introduction for vessels' standing rigging not yet made, or so limited only, as not to be generally known.

However, when it shall have become developed by *our own* experience in the mercantile aud naval marine service of this country, as I feel assured it soon must, its advantages will be as equally appreciated here, as they now are with our friends across the Atlantic, and its application be as common.

Bridges.—With regard to the application of wire rope to bridges, I need only to mention the "Niagara Suspension Railway Bridge," the complete success of which stands as a noble monument to the skill and persevering energy of its projector and builder, Mr. James A. Roebling, whose success is the more gratifying, from the general distrust that was felt at its commencement.

The cables of this bridge are four in number, *each* being ten inches in diameter, containing seven strands, each strand having 520 wires of No. 9 wire gauge, or 3,640 for a cable. Sixty of these wires form one square inch of solid section, make the solid section of each cable 60.40 square inches, wrapping not included. The aggregate strength of the whole four cables being about 23,878.400 lbs.

Wire rope is also soon to become the medium for telegraphic communication, between the continents of Europe and America. If *entirely* used in this great trio of modern advancement, the telegraph, steamships, and railways, the demand would be greater than the present means at command

could furnish, a hypothetical deficiency, however, that would soon be supplied.

But in addition to the foregoing, it is already in extensive use all over our country for working inclined planes on railways, for heavy hoisting in coal-pits, iron, and other mines, and sugar houses; far exceeding, both in economy and safety, either hide, hemp, or manilla ropes, and chains.

It is equally applicable to store and warehouses, foundries, &c., for staying derricks, cranes, shears, chimneys, masts, &c.; for steering purposes on board vessels, for tow-lines, lightning conductors, and dumb waiters in buildings, and sash weights in windows.

On inclined planes and in mines, they are not only safer, but more economical, the degree of economy depending on other circumstances, always being however in direct proportion to the speed of its working, and to the consequent degree of vibration. When worked at a velocity of 8 to 12 miles an hour, driven by badly arranged machinery, continually getting out of order, it will last about two years, and pass 300,000 tons *gross* weight, over planes half a mile in length and rising one in ten. The Pennsylvania Coal Company have ropes of less size on *their* planes, performing five times the work.

Those in use on the inclined planes of the Morris Canal, are two inches diameter, drawing loads of (one hundred) 100 tons over inclinations of one in twelve, at the speed of five miles an hour, and last, in consequence of perfect machinery and good usage, seven to eight years.

Manufacture.—I will close this paper by briefly describing the powers of its manufacture, which, like the production of many other similarly valuable commodities, is simple, yet combining with much ingenuity, and a great deal of well arranged machinery.

The iron, first of all, should be of the very best quality.

The bars are first heated to a welding heat, then passed a number of times through a train of three rolls, running at a velocity of about 500 revolutions per minute, reducing the iron down from $1\frac{1}{8}$ inch in diameter to about $\frac{1}{4}$ of an inch.

Then scaled or cleaned by being placed in warm water with a little sulphuric acid or vitrol mixed, afterwards coated with a preparation of leece or paste made of rye flour, and one end being filed down, passed through a thick drawing plate containing a series of conical shaped holes, and drawn down to No. 5 thickness of wire guage, which is about the limit of reduction it will sustain, until softened. The process of annealing next takes place, occupying from 5 to 8 hours, and then another course of cleaning and drawing. The number of times this is repeated, depending on the fineness of wire required; for very fine wire it may be a half a dozen times

The wires now being prepared for use, next comes the laying from them of the strands, and finally, the laying of the strands into rope.

Each strand usually consists of 3, 7, or 19 wires, the ropes having 9.49, or 133 wires.

The two most important considerations to be effected in laying up the rope are, that when the rope is made and subjected to its duty, that the tension of each wire shall be equal, and that there shall no twist take place in the wires while being laid into strands, nor in the strands while being laid into the rope.

The first is effected by a simple mechanism of weights suspended, one at the end of each wire passing over pullies, and are slackened as the strand is forming, and the weights drawn up, and the same is the case with regard to the strands, the weights being proportionally increased.

The latter requires more machinery but very ingeniously arranged, (and which is patented by the manufacturer) being no less than a continual revolving of each wire, while the strand is being formed, and also of each strand while the rope is being laid—a striking and peculiar feature in this arrangement is, that it enables the *centre strand* to be similar to the others, *of wire*, instead of using hemp, so that where rigid ropes are required, as in standing rigging, the strength is very materially increased.

The foregoing, I hope, may give a general idea of the process of making, but a correct knowledge of the machinery could hardly be imparted, unless by observation when in operation.

To the ends of wire rope when required, can be attached a socket, hook-clevice, turnbuckle, or any similar appendage, in a perfectly secure and safe manner.

The ropes may also be easily spliced, &c., &c.

MARINE FIRE ENGINES.

The Brooklyn Union Ferry Company have performed an act worthy of the highest commendation, in their very successful effort to place the vessels in the harbor of New-York and Brooklyn, and the warehouses along the wharves, in the same state of security against the devouring element of fire, that the more inland portions of the cities have been placed by their respective fire departments. On two of their boats, the Fulton and Nassau, they have placed double-action steam-pumps, in addition to the full complement of pumping force of the boats. These extra steam-pumps or fire engines, can be used any where in the harbor, and are each capable of throwing a stream of water through 700 feet of hose, extending from the ferry house to the heights of Brooklyn, a distance of 100 feet, and then the stream extending above the houses through a pipe $\frac{7}{8}$ in. diameter. The steam power for its operation is drawn from the boiler of the boat. Other ferry companies should follow this praiseworthy example in every city of the Union

CLIPPER-SHIP RED JACKET.

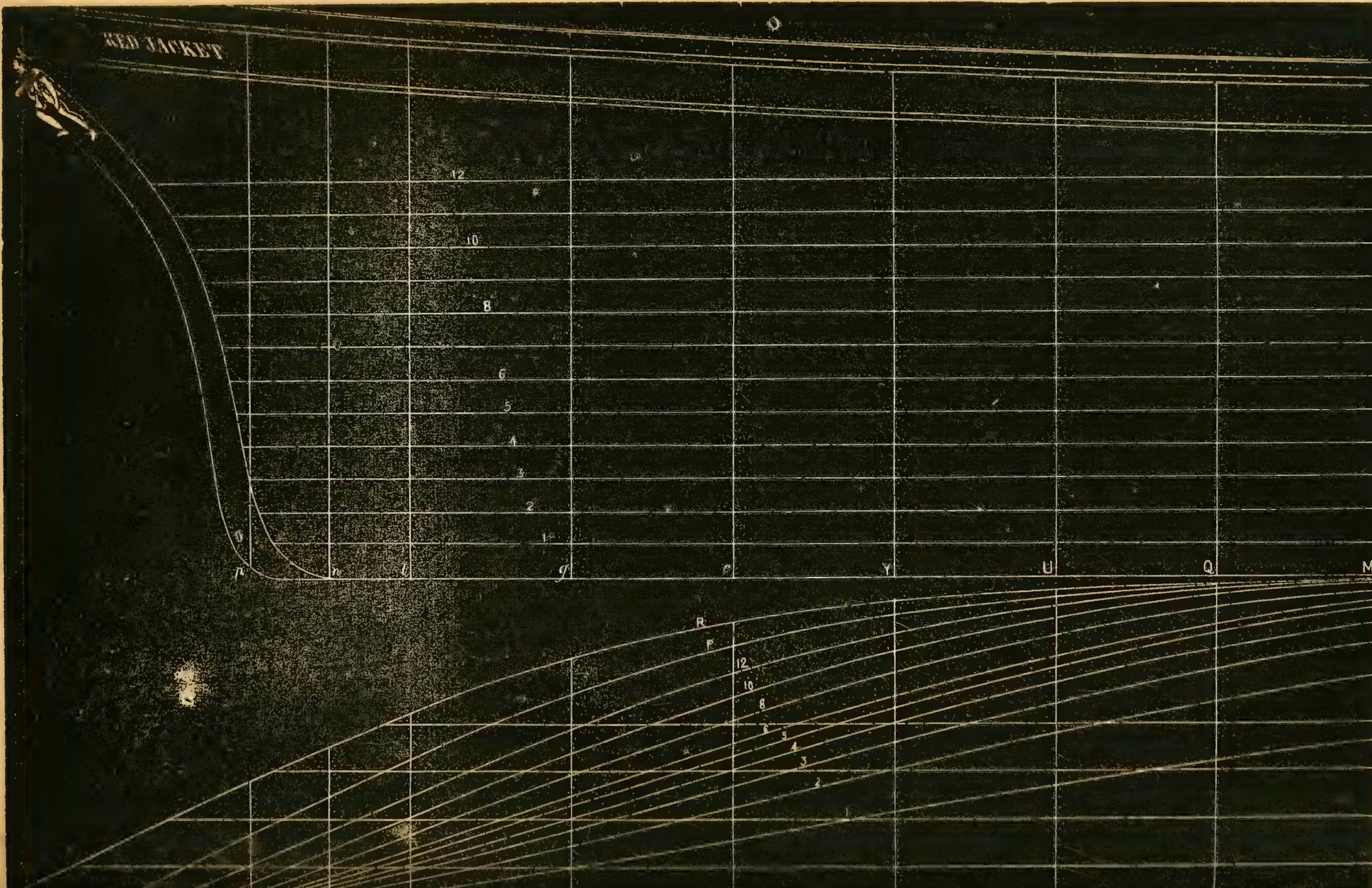
This vessel has been regarded by many as one of the finest of her class. She was built in Rockland, Maine, by Mr. George Thomas, under the direction of Captain Isaac Taylor, of Boston, *a man of energy,—of the "live and let live" stamp*—whose ships bear the imprint of advancement; and were it not for the few there are of such men, this would be a stand-still instead of a progressive age. This vessel has proved herself to be a fine sailer, having frequently sailed 350 nautical miles in 24 hours. She is buoyant and weatherly, and withal a fine sea-boat; and we only regret that one of her logs cannot be found. Her dimensions are as follows: extreme 250 feet long, 44 feet wide, and 24 feet deep. Her design is the result of a *carte blanche* given to Mr. S. H. Pook, of Boston, by whose politeness we furnish the lines of this fine vessel.

SPARS OF CLIPPER-SHIP RED JACKET.

	Length. Ft. In.		Feet.		Ft. In.		Ft. In.
Foremast,	89	head,	16	Yard,	80	arm,	5
Topmast,	50	"	10	"	63	"	5 6
Topgallant,	26 6	"		"	47	"	3 6
Royal,	18	"		"	37	"	2 6
Skysail,	12 6	pole,	5	"	28	"	1 6
Mainmast,	92	head,	17	Yard,	90	arm,	5
Topmast.	54	"	11	"	70	"	5 6
Topgallant,	30			"	53 6	"	4
Royal,	20			"	44	"	3
Skysail,	14	pole,	6	"	35	"	2
Mizzenmast,	82	head,	14	Cross-Jack,	70	arm,	4
Topmast.	43	"	9	Yard,	56	"	4 6
Topgallant,	24			"	43	"	3
Royal,	17			"	32	"	2
Skysail,	11	pole,	4	"	23	"	1
Bowsprit,	23 out.						

Jib-boom, 20 by 15 by 5. Spanker-boom, 60 end 2
Spencer gaff, 24. Gaff, 45 " 5
Foremast below deck, 22 feet. Mainmast below deck, 20 feet, 6 inches.
Mizzen " " " 20 " 9 inches.
Stations on Deck: Knight heads to foremast, 50 feet; Fore to main, 78 feet; Main to mizzen, 64 feet; Mizzen to taffrail, 49 feet, 6 inches;—241 feet, 6 inches.

A Sailor Overboard.—At sea, on the night of the 30th January, 1856, William McFarren, seaman, of Orland, Maine, on board the U. S. frigate San Jacinto, bound for the East Indies, fell from the jib-boom into the sea, and was drowned. The sea was so very rough that a boat could not be lowered in time to save him. He was not seen after his fall into the water. "He bore a most excellent character in the ship," says the official report of his Captain to the Navy Department.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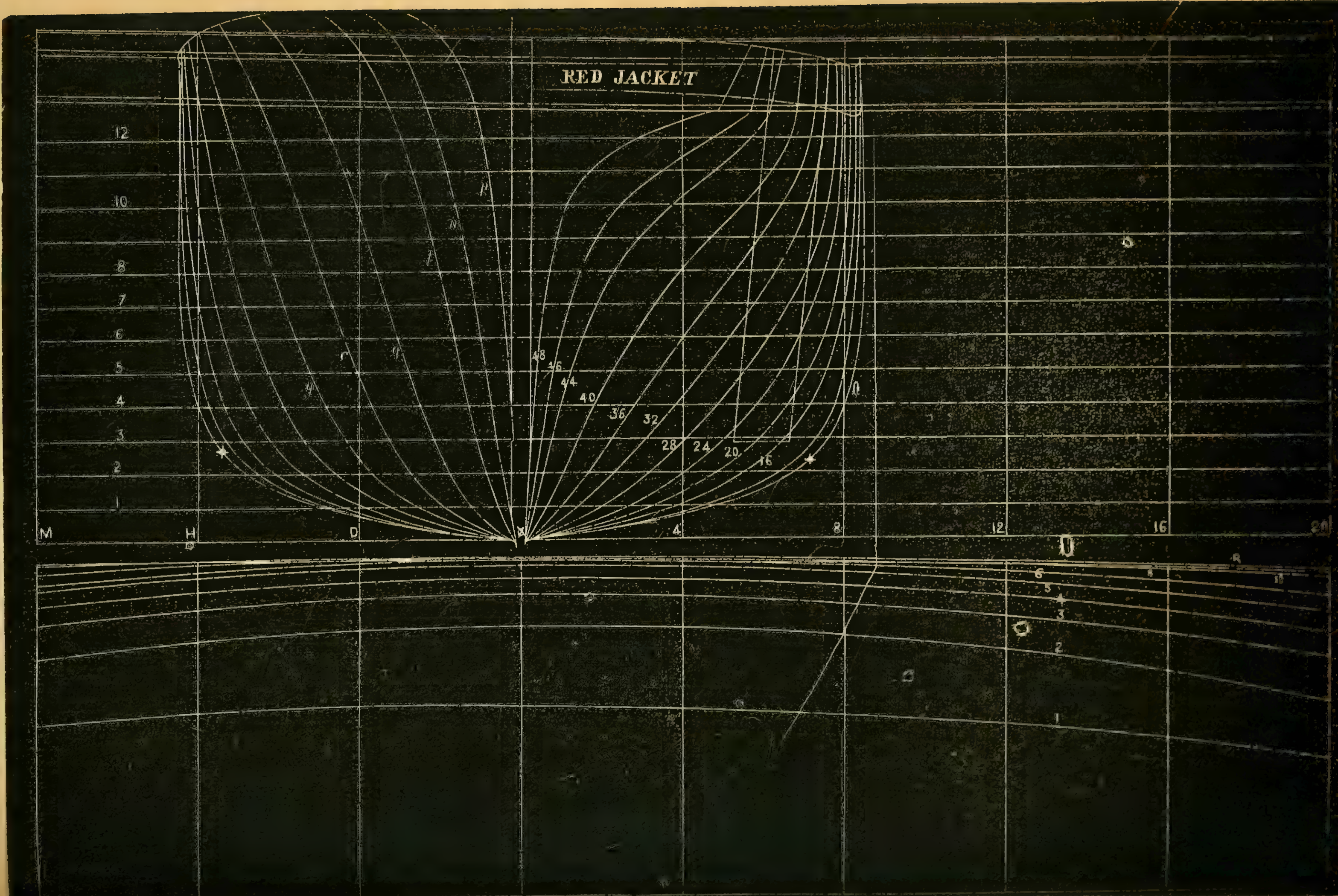
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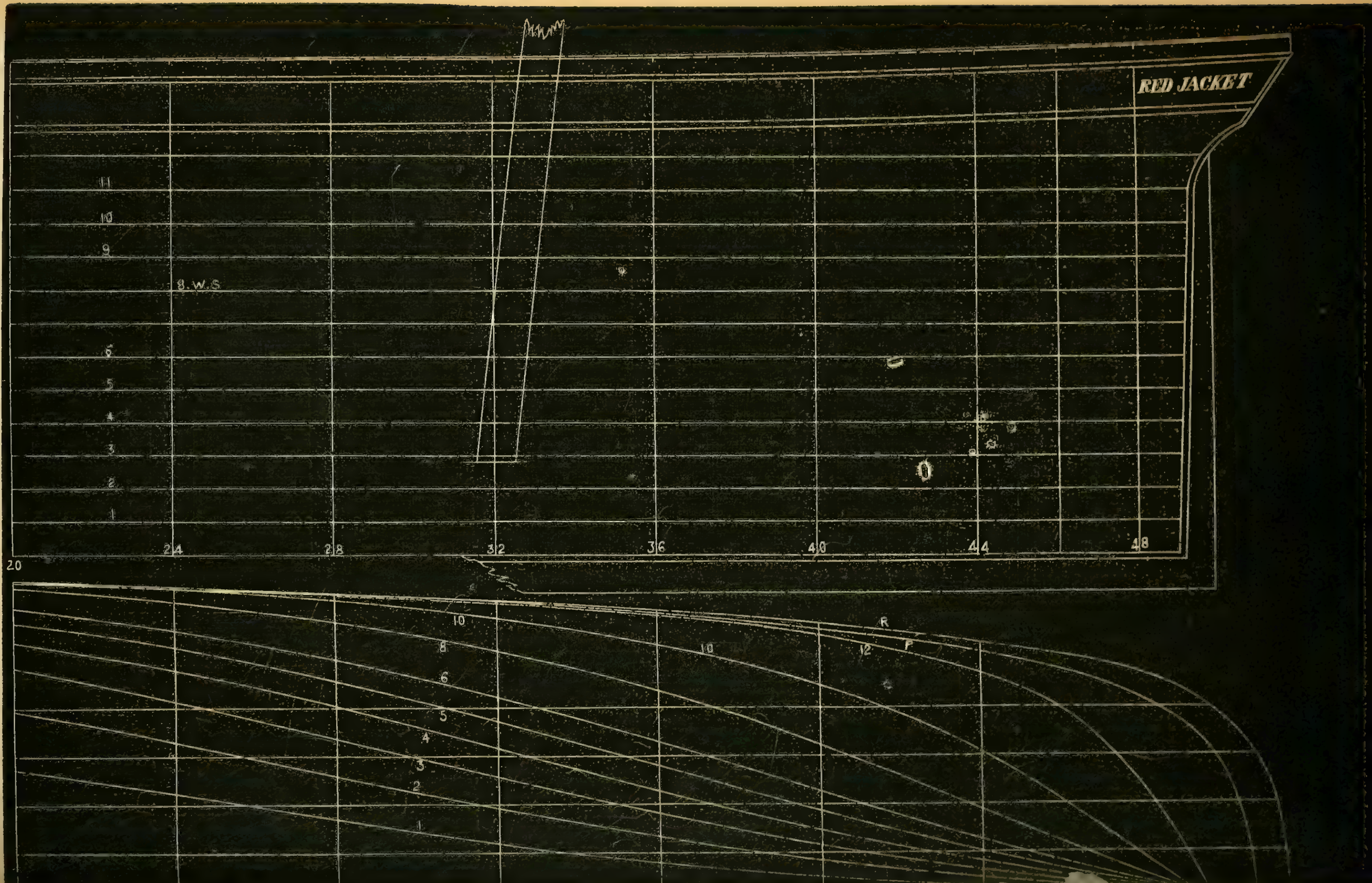

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APPRENTICES.

In our last issue we welcomed the entire pupilage in Nautical Mechanism, to an audience in the editorial *sanctum*, by means of letter. We have had no intelligence beyond a few well wishes from them during the past month, and we are frank to confess that it somewhat surprises us. We ourselves are prepared to learn from any one, and find that there are many things yet to be learned, but who is to teach? We say any one who can and will, but where is the man who, being himself qualified, will care enough for our interests to undertake to teach gratuitously? We have not yet found him. Compliments to us, while they may be gratifying to our feelings, can certainly be of little avail to the inquirer after mechanical knowledge. But we know that habits are like bands of iron when once created, and though, as we had occasion to remark in our last communication, "mechanics are not made in theatres, ball or bar-rooms, yet if the habit is once formed, it is like sundering a band of iron to break loose from it. Perhaps many of this class of our readers would be glad to interrogate us upon many subjects, if they knew how to arrange their questions, so as not to expose themselves. This is a false pride; and we tell them frankly it can do them no good, but is doing a vast deal of harm. Ninety-nine out of every hundred of those who would write us are strangers to us; and if, in order to answer their inquiries satisfactorily, it were necessary to publish the letter or a part of it, their name would not appear in connection. Alas, too many persons at the present day are kept in ignorance, from pride. Said Mr. Locke, when asked how he had acquired such a fund of knowledge;—by not being ashamed to ask questions, was his reply. How many thousands are kept in ignorance by this false pride. What does any man know more than he learns? and how can a person learn unless he exercises his thoughts, and first learns to think systematically? How many persons there are laboring in the ship-yards of America to acquire a knowledge of the art of building vessels, who dare not venture to think independently for themselves. We tell all such, that they never will be ship-builders or even leading mechanics, unless they first think for themselves. The writer well remembers the days of his pupilage, when his employer asked him on a certain occasion, *who gave him a right to think.* The reply is now not less fresh in his memory; it was this—the Power that created him, and he would yield it only with his life. It was *not* for the purpose of curtailing the orbitual circuit of thought in its readers, that this Magazine was established. The design is to enlarge it. It is surprising how little is known about vessels that may not be found in print one hundred and forty years, as we propose to show those apprentices who will take the trouble and redeem time enough to read our Magazine. The pathway to knowledge is one of regular gradation. The channels of intelligence have become so large and numerous, that it is impossible to keep that

person in ignorance who will make the sacrifices to obtain knowledge. Wealth is power, and knowledge is scarcely less available, because it furnishes the means or the material from which wealth is obtained. But this is not all—knowledge furnishes not only the means of acquiring wealth, but the means of enjoying it. Give a man the wealth of California, and let him be ignorant, he will be most miserable. Poverty and ignorance are much better adapted to each others' society. Intelligence adapts itself to a man's position, and sheds a lustre on all his acts, while ignorance is the companion of jealousy and envy, the hot-bed of all the grosser passions of the outer man. We hope to be able to channel off the thoughts of apprentices in the course of the current month, respecting what they themselves seem most to need, and we shall take pleasure in responding frankly to the utmost of our ability.

DEEP SEA SOUNDINGS.

The U. S. Nautical Magazine and Naval Journal for May, contains a description by Capt. T. Spratt, R. N., of Bourricis' Sea Sounding Instrument, illustrated by a drawing.

The subject of deep sea sounding is of particular interest to Americans, for by them the first systematic soundings of practical value were made in the deep sea; resulting in a map of the bottom of the Atlantic, and the project of a sub-marine telegraph to England.

The American instrument, by which specimens of the bottom were brought up from depths of two and three miles, is alluded to by Capt. Spratt, as inferior to the English apparatus.

The gallant Captain seems to misapprehend in some measure the character of the work in the hands of the Americans. It will therefore serve a good purpose to remark, that the American instrument was intended to act at the greatest depths of the ocean. It was essential to the attainment of this object that the instrument used to detach the weight should be so small and light as to admit of recovery, and that it should act, even if the line remained tight after the lead reached bottom; and that the line does remain tight, is very evident from the slow sinking of the lead at great depths—the same force that takes the line from the boat then acts upon it at the point of attachment to the lead.

Again, it was essential that it should act on soft bottom in mud—for the bottom of the deep sea, so far as it has been sounded, is of the softest character. The particles of solid matter suspended in the sea water are deposited as if they had first been subjected to a sifting process, the largest par-

ticles near the shore becoming smaller, and at length minute as they reach the bed of the deep ocean.

The microscope tells us that there the deposit is composed entirely of infusoria or their shells. No specimen of other character has yet been obtained. Off the coast of Kamschatka, at 900 fathoms, pebbles smaller than mustard-seed were found in the sediment; but at 1,700, at 2,700, and at 3,500 there were no vestiges of them.

It was also essential that the instrument should bring up specimens of the bottom; and as now used, it never fails to bring up ample quantity.

Lastly, it was essential that a uniform system should be adopted in order that laws governing rates of descent might be determined; therefore spheres of lead of particular weights were used.

All irregular, uncomparable and cumbrous forms were carefully avoided. So far indeed has this care promoted the success of the undertaking, that the weight of the instrument has, at the suggestion of Lieut. Maury, and as experience dictates, been still more reduced.

You will perceive by the engraving of the American instrument in its most approved form, that all the essential qualities alluded to have been there combined.

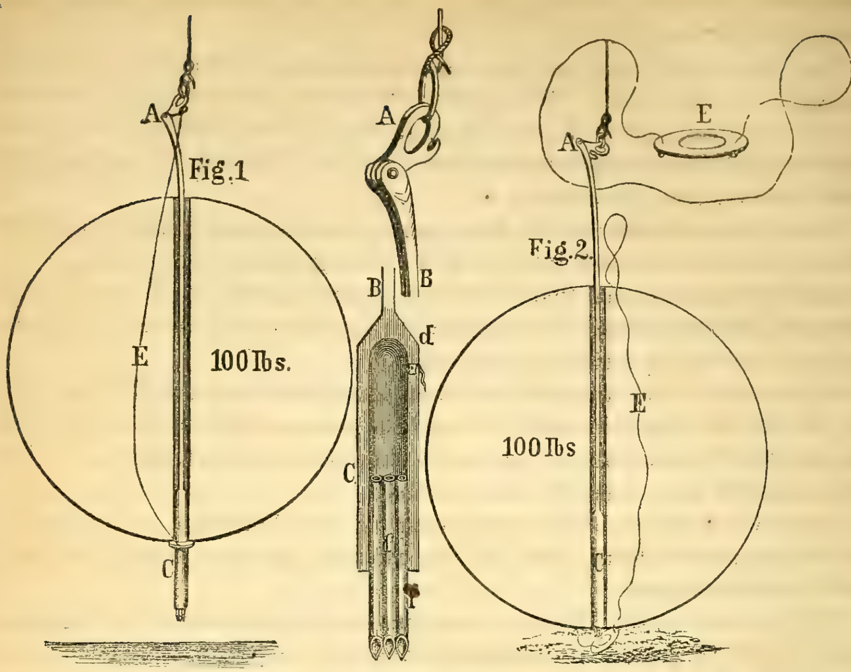
With regard to the English invention, used successfully at 300 fathoms, and alleged to present its advantages over the American instrument at a glance, it may be remarked, that the weight of the arms acting as levers to open the cross-hooks by which the weight is suspended, must always be considerable, and the greater the depth, the greater the weight required in those arms to enable them to pull down the line; and unless the line be singularly slack, they will not then fall, to release the sinker, yet they are to be recovered. In the American instrument the sinker itself performs this function.

If the instrument enters a soft deposit, such as lies in the deep sea, will the arms fall even if the line be slack, unless their dimensions and weight render their recovery impracticable? And then supposing the weight or sinker detached, is not the inverted cup liable to be buried like an anchor beneath it? Very little resistance *there* will ensure the parting of the line above.

Finally, how are experiments made with every variety of sinker, "a pig of ballast or an old fire bar," to be compared in determining the absolute depth reached, for in deep sea sounding this determination depends upon the rate and whole time of descent.

And why, if desirable, may not sinkers of any form be used with the American instrument, if that character of sounding is desired?

JONATHAN.



Description of Brooke's Improved Deep Sea-Sounding Lead. Figs. 1 *and* 2.

A, hinged arm, from which is suspended the lead, by the slings *E*.
B, rod.
C, end of rod, with goose quill inserted to receive the specimens.
D, valve of thin leather permitting the water to pass through as the rod descends.
The valve, *D*, should be let into the side of the rod, that it may not interfere when the shot is detached.

In late experiments the quills have always been found fully charged with sediment; they were taken from the rods caked at both ends, and preserved in alcohol for the microscopist. Many organic forms have been observed by Prof. Bailey, in specimens thus preserved and sent home from the Rodgers' Exploring Expedition.

There should be grooves made in the side of the leaden ball for the slings to rest in; they are required to steady the shot and to keep the slings at right angles to the arm.

STEAMER OCEAN BIRD.

THIS vessel has been sold, and is now destined to ply between Havana and Cadiz, (Spain,) a distance of near 4,000 miles.

An effort was made a short time since to obtain possession of her in a clandestine manner at night, by the aid of a steam tug. The effort was unsuccessful, and the vessel was brought back. A similar effort was also made to obtain possession of her model, but failed.

THE GREAT NAVAL REVIEW.

" One useful truth we learn from this Review:
It shows us what we could, but did not do.

London Chronicle.

History of the American Privateers, 1 vol. 8 vo. 438 pp. By Charles Coggeshall. New-York: By and for the Author, 321 Broadway.

A line of naval steamers, gun-boats, and floating batteries, of more than twelve miles in extent, welcomed with the loud huzzas of an extensive commercial marine, and over 100,000 of England's best landsmen, all rejoicing over a safe return from the war—needed no *mock* fight to make it one of the most splendid sights in modern peacefare. But the patriotic sublime could have been much better appreciated and rejoiced over, unassociated with the Admiralty blundering—enough of this had been sufficiently prominent in another field of view. To delight the eyes and deafen the ears of the multitude, all does very well for a time, to drown disappointed expectation from such a wonderful display of power; but scarcely has the smoke cleared away, ere new and potent suggestions for future exhibitions are proclaimed to the world from the big guns at Paris, that henceforth:

1. "Privateering is and remains abolished.
2. "The neutral flag covers enemies goods, with the exception of contraband of war.
3. "Neutral goods, with no exception of contraband of war, are not liable to capture under enemy's flag.
4. "Blockades in order to be binding must be effective—that is to say, maintained by a force sufficient really to prevent access to the coast of the enemy. The governments of the undersigned Plenipotentiaries engage to bring the present declaration to the knowledge of the "(U. S.)" States, which have not taken part in the Congress of Paris, and to invite them to accede to it.

"Convinced that the maxims which they now proclaim cannot but be received with gratitude by the whole world, the undersigned Plenipotentiaries doubt not that the efforts of their governments, to obtain the general adoption thereof, will be crowned with full success. The present declaration is not and shall not be binding, except between those powers who have acceded, or shall accede to it. Done at Paris the 16th of April, 1855."

Here follow the signatures.

Verily Mr. Coggeshall must have furnished this Peace Congress with advance sheets of his History of American Privateers.

Our Navy, counted on the register which is annually issued by order of Congress, cuts but a small figure numerically, by the side of the grand display at Spithead; but the holy horror of such a Navy as, not without good reason, the assembled Plenipotentiaries of maritime Europe are led to contemplate from the history of the past, the United States could and would

bring to bear in a naval contest at the present day, render their declaration of maritime law so palpably significant to every half-grown American, as to make it too obvious for comment.

The policy of moulding maritime law according to political views and commercial circumstances, is as old as England's boasted supremacy of the seas; and now that this has ceased to be maintained, a tack for the sake of a fairer wind in another direction, would be no more palatable in time of war, than the gratification of being cut to pieces by an established Navy for war purposes, than by one constituted for the time, out of material intended for a far nobler object. It certainly is not, never has been, nor ever can be, compatible with the best interests of the United States to maintain a large standing army, nor a naval establishment for war purposes.

A small but *efficient* Navy for the protection of commerce in time of peace, is all that the policy of our country dictates:—as we aim not to aggress, there is no necessity for our going armed.

What our citizen soldiery is to the army in time of need, our *marine militia* is to the Navy. Self-defence is a right acknowledged, in our naval warfare, maintained, and ever will be, regardless of all orders in council, whether they emanate from State or Peace Congresses. And the noble self-sacrificing zeal and patriotism of the American Privateers, who are now for the first time collected together in the pages of a single volume, furnish the very best answer of the United States, to the constituted marine law makers for monarchies, that it is possible to produce.

The message of President Madison, which begins Mr. Coggeshall's volume, introduces the reader to a self-sacrificing zeal, and almost fanatical patriotism, nowhere else to be found but among their co-laborers, in resistance to the same conceited principle which now dictates, but in times gone by, forced the practice of, upon all who were too weak to defend themselves.

"To arrive at the odium entertained against privateering by the honest and virtuous part of the world, I must carry my readers back to the piratical age of the reckless buccaneers, which continued for a period of twenty or thirty years, say from 1610 to 1640.

Although these piratical vessels occasionally infested almost every sea, their principal resorts were along the coasts of the Spanish Main, and among the West India Islands. These desperate buccaneers committed all sorts of barbarous acts, and were, in fact, a terror to the commercial portion of all civilized nations. They spared neither friend nor foe, and were alike regardless of age or sex.

Their only object was robbery and plunder, and by these means to enrich themselves, at the expense of the honest and industrious portion of mankind. These ruthless bravadoes, by the habitual practice of rapine and murder, became so hardened in crime, that they seemed to riot and rejoice over the sufferings of their innocent victims.

No wonder, then, that a strong and deep feeling of enmity should still continue to be felt against privateering for centuries after it was abolished. In Europe, where a large portion of every community is uneducated, it requires many long years to eradicate a deep-rooted prejudice from among the masses, long after the enlightened classes are convinced that such transactions are no longer in existence. Even in our own intelligent country there exists a strong prejudice against privateering, from the same cause as before stated, namely, by associating it with the by-gone days of the reckless buccaneers. It is to be hoped, however, that our late war with England has created a more favorable feeling on the subject, and that a more liberal sentiment will be cherished towards privateersmen, and to those who were employed in private armed vessels. The American people must be convinced that in our last war with England, it was carried on by privateers and private armed vessels, in a spirit of honorable warfare, and generally by gentlemen of high and patriotic sentiments, and in most instances with marked humanity, coupled with acts of generosity and kindness toward their avowed enemy, and, as I believe, with a sincere desire to soften the rugged features of war.

It is true that every honorable device was practiced to cripple our enemy, by diminishing his means and power to injure us, and thus compel him to an honorable peace.

It must always be borne in mind that the war on our part was strictly confided to the injury of Great Britain, and that in no instance was a single neutral nation involved in loss or insult by our privateers.

In this age of traffic and money making, when patriotism is measured by dollars and cents, remarks prejudicial to those who sailed in privateers, and letters-of-marque, are made by some without much reflection or knowledge on the subject. Others assert that they were a mercenary set of desperadoes, only bent on enriching themselves with the spoils of their adversaries, possessing little honor and less patriotism. Now if there be a single respectable individual possessed of this opinion, I shall be happy to disabuse his mind on the subject, for I can assure him that there never was a viler slander imputed to such a noble class of men. I am happy to say that I was acquainted with scores of the captains and officers who sailed in privateers and letters-of-marque, during our war with England, and am confident that a large proportion of those who commanded those vessels, as well as their officers and seamen, would favorably compare with the same class of military men, in any army or navy in the world."—*Introduction*, pp. XLIV—XLVII.

Without any knowledge of such a forthcoming work, we have so lately made the old privateer service the subject of special consideration, it would now seem superfluous to do more than most heartily recommend the perusal of this book, to all who are interested in the proudest achievements of our Navy.

At a time when foreign potentates are countenancing the enlistment of land volunteers, and their accredited plenipotentiaries and consuls are so employing themselves, against all national law and order, for these same powers to undertake by establishing laws for themselves, and seeking the consent of all other States thereunto, for the maintenance of naval establishments, first instituted for no other purpose than agression, and wholly unnecessary for peace purposes, the history of *American Privateers* would have been the best object of research for any one disposed to combat the tenor of the Convention of Maritime Law at Paris, and nothing could be more apropos than the appearance of Mr. Coggeshall's book at this time. It is a faithful, but necessarily brief history—for of the 255 privateers here accounted of, there are several of them whose individual exploits could be made to swell a volume equal to this. There is nothing here but what every good and true American ought to know, that the American *Marine Militia* is and always has been an honor to the country; that the privateers of the U. S. were regularly instituted and cherished by our best statesmen, and did as effective and honorable service, and were constituted of as good, honorable, highminded, and patriotic men, as any other class in our last war with Great Britain; and that our nation has not duly considered their service in its legislative action, concerning its best servants.

MARINE DRY DOCKS.

It is our purpose to publish an account of the facilities furnished in the United States, both on the Atlantic and Pacific coasts, for repairing vessels, as fast as we can gather the materials. The greatly increased size and number of the ships of the present day over those of a quarter of a century ago, demand a corresponding increase in such facilities for construction and repairs, as are afforded by dry and other docks, marine railways, &c.

Permanent excavated dry docks of solid masonry are owned only by the Government; the enormous cost of such structures forbid their general use by the mercantile marine, which makes use of various substitutes for such docks. Of these, there are a variety both in efficiency and cost; the consequent accidents and delays attendant upon their use, make it desirable that these difficulties should be remedied. One of the simplest kinds of dry docks, and, at the same time, easy of access, is that invented and patented by Mr. J. E. Simpson, of Boston, a description of which may not be uninteresting to the readers of the *Nautical Magazine.*

The nature of Mr. Simpson's invention consists in making use of the natural stratum of clay for the floor of his dock, and continuing the same up the walls by puddling, thus making the bottom and walls a solid and contin-

uous mass of clay, impervious to water; one end of the dock is provided with swinging gates and a caisson.

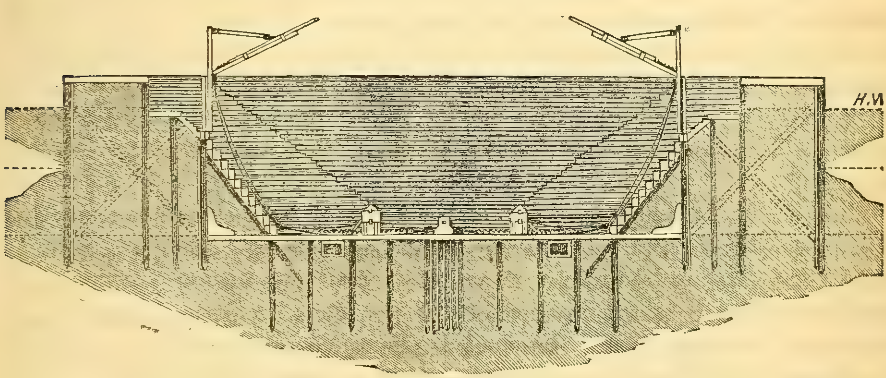
To obtain an appreciating understanding of this construction, it will be necessary to enter a little more into detail.

The site selected for the dock must overlay a natural stratum of clay, and be enclosed by a coffer dam from within, into which the water is drained, and any sand or other matter that may cover the clay be removed.

Double rows of piles are then driven several feet apart, along the sides and end of the dock, and capped with heavy, hard pine timber, securely fastened to the piling.

Spur braces are driven on an angle from each pile of the inner row toward the centre of the dock, and these, with vertical cross-braces between the rows of piles, are securely fastened thereto. The outer row of piling is planked down to the clay stratum, and the inner row to the spur-braces, which are also planked to the clay stratum.

This enclosed space is filled with clay, dug from the dock to deepen it, which is puddled or rammed hard, forming a perfect union with the floor of the dock, as represented by the cut. Large rectangular spaces are enclos-



ed for the abutments of the gates, by driving the piles close together, and the enclosures are strengthened, by kneeing and bracing, sufficiently to receive the thrust from the swinging gates, and are also filled with clay. The swinging gates traverse on railway trucks, and are hinged to the abutments in the usual way. The gate sill is formed of sheet piling, tongued and grooved, and driven deep in the clay. Beyond the gates is placed the ordinary caisson.

It will be seen that no artificial foundation is necessary to support the walls of the dock. No small space is left between the bottom and the walls through which water can percolate and undermine the structure, nor can the bottom be subjected to the hydrostatic pressure of the external column of water, which endangers the integrity of other permanent dry docks. In

every other kind of dock the foundation required for the dock itself exceeds that required for the support of the largest vessel which it is capable of receiving. It is practically impossible to make the contact of a stone or wooden dock with its bed so perfect as to exclude the water tending to force up the bottom or undermine the dock. In a stone or wooden dock the greatest care must be exercised in docking, to distribute weight evenly, for if an excess is brought upon any point there, the structure of the dock is liable to be impaired by yielding. It is evident that Mr. Simpson's dock cannot be injured by weight, however it may be distributed, and it is on this account that such docks offer peculiar facilities for docking vessels that are badly strained.

Mr. Simpson has constructed two docks on his patented plan in Boston-Harbor, one of which is 254 feet in length inside the turning gates, with 20 feet more from the point of the gates to the caisson, 70 feet wide at the top and 50 at the bottom, affording ample room for a full set of bilge chocks, an advantage not possessed by the government docks; 25 feet from bottom of dock to cap, 48 feet wide between abutments, and has 18 feet of water, with over 30 inches of keel blocking, at ordinary high tides. Piles are driven all over the bottom of the dock 4 feet apart, and capped across the dock with hard pine timber, on which are the bilge chocks. Within the abutments to the sheet piling forming the gate sill, piles are driven close together, and capped solid with hard pine timber. The keelson, which is 16 by 32 inches, is scarfed, and rests on piles driven close together between the cross timbers. On the keelson rest the keel blocks 3 feet apart the whole length of the dock.

This dock was commenced September 1st, 1853, and since its completion there have been docked 151 sail of vessels, comprising 72,393 tons, without delay, accident, or damage. A vessel of 500 tons has been filled with water in this dock, to within one foot of her deck, to find leaks, without straining her in the least. The dock is planked over the cross timbers on the bottom for convenience, and the amount of water which leaks in, in 48 hours, does not exceed ½ an inch in depth on the clay bottom beneath the flooring, and comes principally through the joints of the flood gates.

The second dock which was commenced April 1st, 1855, is 165 feet long, 46 feet wide at top, 20 feet deep from crossing, 33 feet between abutments, with 15 feet draft of water at ordinary high tides, and was completed in 80 days from its commencement, so that the brig Demerara of 200 tons was taken in and repaired.

Two large centrifugal pumps, driven by a steam engine, are so arranged as to pump from either dock at pleasure, and the machinery is of such capacity, that the large dock has been pumped dry from 18 feet of water above the plank flooring, no (vessel being in the docks,) in 90 minutes.

These docks are surrounded with all the conveniences for conducting

repairs with facility and despatch, and also for receiving and delivering cargoes whilst vessels are in the dock. To the energy and perseverance of Mr. Simpson, Boston is indebted for these convenient docks, which have proved, by practical demonstration, that the doubts and fears felt by many, and strongly felt by others, were groundless.

NEW-YORK YACHT CLUB.

REGATTA FOR 1856.

THE Annual Regatta of the New-York Yacht Club will come off on Thursday morning, the 5th of June, at eleven o'clock, under the direction of the Committee of Arrangements appointed therefor.

There will be a prize valued at $250 for each class of yachts.

The yachts will be divided into three classes; the first to include those carrying 3,300 square feet of canvas and upwards in their sails; the second, those carrying 2,300 square feet and under 3,300; the third, those carrying under 2,300 square feet.

For the purpose of this classification, all sails are to be excluded, except the mainsail and jib of sloops, and the mainsail, foresail, and jib of schooners.

The classes will be allowed time for canvas or sails, as follows:

The first class, *one second* per square foot of canvas. The second class, *one and one quarter seconds* per square foot of canvas. The third class, *one and one half seconds* per square foot of canvas.

This allowance shall be based upon the mainsail and jib of sloops, and the mainsail, foresail, and jib of schooners, and upon any other duly measured sails actually set at any time during a race. As between sloops and schooners, this allowance shall be based upon nine-tenths of the area of the schooner's sails.

The courses marked out for the sailing are as follows:

A vessel will be moored, bow and stern, abreast of the Club-House at Hoboken; on the east side of which the yachts will anchor, head to wind, in the following order of position, commencing from the stake-boat with the yachts of the least canvas. The third class abreast of said stake-boat 100 yards apart on a line due east; second class on a line parallel with the same, 200 yards to the north; and first class on a similar line, 200 yards to the north of the latter. They may have their mainsails, or foresails and mainsails, according to their rig, hoisted, and gaff-topsails set. The Committee reserving the discretionary power, however, of ordering all sails to be lowered before starting, or of adopting any other mode of starting they may deem proper, should the weather prove boisterous, or circumstances render a change necessary.

The yachts will pass to the westward of a flag-boat stationed off Staten Island, below the Quarantine Ground; thence easterly, to a flag-boat stationed off Long Island, above Fort Hamilton, passing it to the north and east; thence around the Buoy of the Southwest Spit, passing it from the north and east.

Returning, they will first pass the flag-boat anchored off the Long Island

shore, passing it to the south and west; thence to the flag-boat abreast of the Club-house, Hoboken, passing it to the westward.

In going and returning, the buoy on the west bank is to be passed to the eastward.

The sailing regulations of the Yacht Club to govern in all cases.

Printed copies of these regulations will be furnished to the members by applying to the Secretary.

The attention of members is called to the following rules and amendments thereto:

"The model of each yacht must be deposited, and a statement containing her name, rig, dimensions, and Custom-house tonnage, and the name of her owner, must be filed with the Recording Secretary, before she can enter for the regatta.

"Owners of yachts, proposing to enter for any regatta, shall give notice in writing to the measurer, specifying the time and place, when and where their yachts sails may be measured; such time to be not less than twenty-four hours after the delivery of said notice, and during the ten days next preceding the limited time for entry, and such place some convenient part of the New-York harbor.

"Upon said measurement. the measurer shall receive such reasonable aid as he may require, from the crew of the yacht measured.

"Yachts to be allowed to carry men as follows:

"First Class—One to every four tons. Second Class—One to every three and a half tons. Third Class—one to every three tons.

"No member shall be interested in more than one yacht entered for any regatta.

"There shall be no restriction on duly measured sails that may be carried by yachts contending for prizes.

"No change in the dimensions of sails shall be made between the time of measurement and the conclusion of the regatta, except by reefing; and no sail shall be set during a race, which has not been regularly measured and returned by the measurer."

Entries will be received until Tuesday, June 3d, 11 o'clock, A. M., at the office of the Secretary of the Club, 4 Pine-street.

Owners of yachts are requested to have them at the anchorage abreast of the Club-House, by 2 P. M., on the day previous to the regatta.

Notice will be given on the morning of the regatta, as to the order of starting.

N. B.—The Southwest Spit bears from the centre of the Narrows due South; distance from Robin's Reef Light, $10\frac{3}{4}$ miles.

CHAS. H. HASWELL,
J. W. CHANLER, } *Regatta Committee.*
J. E. DAVIDSON,

NEW-YORK, *May*, 1856.

All communications for the regatta Committee to be addressed to the care of N. BLODGOOD, *Secretary*, 4 Pine-street; and all for the Measurer, to CHAS. H. HASWELL, 6 Bowling-Green.

N. B.—A steamboat for the exclusive use of members and ladies will be provided by the Club. Tickets of admission will be sent to each member in due season.

THE TREATY OF PARIS.

The Peace has been formally and officially proclaimed. Ratifications were exchanged in Paris on the 27th of April, by Plenipotentiaries in full costume. On the 29th, the proclamation was made with mediæval formalities, by herald, in London.

As this is the most important document of the times, we here give it, in full:

Art. 1.—From the day of the exchange of the ratifications of the present treaty, there shall be peace and friendship between his Majesty, the Emperor of the French, her Majesty, the Queen of the United Kingdom of Great Britain and Ireland, his Majesty, the King of Sardinia, his Majesty, the Sultan, of the one part, and his Majesty, the Emperor of all the Russias, of the other part, as well as between their heirs and successors, their respective States and subjects in perpetuity.

Art. 2.—Peace being happily established between their aforesaid Majesties, the territories conquered or occupied by their armies during the war shall be reciprocally evacuated.

Special arrangements shall regulate the mode of evacuation, which must be effected as promptly as possible.

Art. 3.—H. M. the Emperor of all the Russias engages to restore to H. M. the Sultan, the town and citadel of Kars, as well as all the other parts of the Ottoman territory of which the Russian troops are in possession.

Art. 4.—Their Majesties, the Emperor of the French, the Queen of the United Kingdom of Great Britain and Ireland, the King of Sardinia, and the Sultan, engage to restore to his Majesty, the Emperor of all the Russias, the towns and ports of Sebastopol, Balaklava, Kamiesch, Eupatoria, Kertch.

Art. 5.—Their Majesties, the Queen of the United Kingdom of Great Britain and Ireland, the Emperor of the French, the Emperor of all the Russias, the King of Sardinia, and the Sultan, grant a full and entire amnesty to those of their subjects who may have been compromised by any participation whatsoever in the events of the war, in favor of the cause of the enemy. It is expressly understood that such amnesty shall extend to the subjects of each of the belligerent parties who may have continued during the war to be employed in the service of one of the other belligerents.

Art. 6.—Prisoners of war shall be immediately given up on either side.

Art. 7.—Her Majesty, the Queen of the United Kingdom of Great Britain and Ireland, His Majesty, the Emperor of Austria, his Majesty, the Emperor of the French, his Majesty, the King of Prussia, his Majesty the Emperor of all the Russias, and his Majesty, the King of Sardinia, declare the Sublime Porte admitted to participate in the advantages of the public law and system (*concert*) of Europe. Their Majesties engage, each on his part, to respect the independence and the territorial integrity of the Ottoman Empire; guarantee in common the strict observance of that engagement; and will, in consequence, consider any act tending to its violation as a question of general interest.

Art. 8.—If there should arise between the Sublime Porte and one or more of the other signing Powers, any misunderstanding which might endanger the maintenance of their relations, the Sublime Porte and each of such Powers, before having recourse to the use of force, shall afford the other con-

tracting parties the opportunity of preventing such an extremity by means of their mediation.

ART. 9.—His Majesty, the Sultan, in his constant anxiety for the well-being of his subjects, having granted (octroyá) a firman, which in ameliorating their lot without distinction of religion or race, proves his generous intentions towards the Christian population of his empire, and desiring to give a further proof of his sentiments in this regard, has resolved to communicate to the contracting powers the said firman, spontaneously emanating from his sovereign will.

The contracting powers acknowledge (*constatent*) the great value of this communication. It is quite understood that the fact of this communication cannot in any case give to said powers a right to interfere, either collectively or separately, in the relations of his Majesty the Sultan with his subjects, or in the internal administration of his empire.

ART. 10.—The Convention of July 13, 1841, which maintains the old regulation of the Ottoman Empire relative to the closing of the Straits of the Bosphorus and Dardanelles, has been revised by common accord.

The act concludes with this view, and conformably to that principle between the high contracting parties is and remains annexed to the present treaty, and shall have the same force and value as if it had formed an integral part of it.

ART. 11.—The Black Sea is declared neutral. Open to the meantile marine of all nations, its waters and ports are formally and in perctuity interdicted to flags of war, whether belonging to any borderingrpewers (*puissances riveraines*) or to any other power, save and except the e x iticns mentioned in articles 14 and 19 of the present treaty.

ART. 12.—Freed from all interference (*entrave*), trade in the pos and waters of the Black Sea shall only be subjected to regulations of health, customs and police, conceived in a spirit favorable to the development of commercial transactions.

In order to give every desirable security to the commercial and maritime interests of all nations, Russia and the Sublime Porte will admit consuls in ports situated on the coast (*littoral*) of the Black Sea, in conformity with the principles of international law.

ART. 13.—The Black Sea being neutralized according to the terms of Article 11, the maintenance or establishment on its coasts of military maritime arsenals becomes equally unnecessary, as well as without object. In consequence, his Majesty, the Emperor of all the Russias, and his Majesty, the Sultan, engage neither to construct nor to preserve any military-maritime arsenal upon that coast.

ART. 14.—Their Majesties, the Emperor of all the Russias, and the Sultan, having concluded a convention having the effect of determining the force and number of those light-vessels necessary for the service of their coasts, which they reserve to themselves the right of keeping up in the Black Sea, this convention is annexed to the present treaty, and shall have the same force and value as if it had formed an integral part of it. This convention can neither be annulled nor modified without the assent of the Powers parties to the present treaty.

ART. 15.—The act of the Congress of Vienna having established the principles destined to regulate the navigation of the rivers which separate or traverse several States, the contracting powers stipulate between themselves that for the future these principles shall also be applicable to the

Danube and to its *emboucheurs*. They declare that this arrangement constitutes henceforth a part of the public law of Europe, and they take it under their guarantee.

The navigation of the Danube cannot be subjected to any duties on property which shall not be expressly provided for by the stipulations contained in the following articles. In consequence no toll (*peáge*) shall be taken that may be based solely upon the fact of the navigation of the river, nor any duty (*droit*) upon merchandise which may be on board vessels. The police and quarantine regulations to be established for the security of the States separated or traversed by this river, shall be conceived in such a manner as to favor the circulation of vessels as much as possible (*autant que faire se pourra*). Save these regulations no obstacle whatever shall be placed in the way of the free navigability.

ART. 16.—With the object of carrying into effect the disposition of the preceding article, a commission, in which France, Austria, Great Britain, Prussia, Russia, Sardinia, and Turkey, shall each be represented by a delegate, shall be charged to design and cause to be executed the necessary works from Isatcha downwards (*depuis Isatcha*) in order to clear the mouths of the Danube, as well as the neighboring parts of the sea, from the sand and other obstacles which obstruct them, so as to put that part of the river, and the said parts of the sea, in the best possible state of navigation.

To cover the expenses of these works, as well as of the establishments having for their object to assure and facilitate the navigation of the mouths of the Danube, fixed duties, at a proper (*convenable*) rate, to be settled by the Commission by a majority of votes, may be levied, on the express condition that in this respect, as in all others, the flags of all nations shall be treated on a footing of perfect equality.

ART. 17.—A commission shall be appointed, composed of delegates of Austria, Bavaria, the Sublime Porte, and Wurtemburg (one for each of these powers), to which commission, the commission of the three Danubian Principalities, whose nomination shall have been approved of by the Porte, shall be joined. This commission, which shall be permanent, will first draw up the regulations of navigation and of the river police; secondly, remove the obstacles, (*entraves*) of whatever nature they may be, which as yet prevent the application of the dispositions of the treaty of Vienna to the Danube; thirdly, give orders for and cause to be executed the necessary works throughout the whole course of the river; and fourthly, after the dissolution of the European commission, see to the maintenance of the navigability of the mouths of the Danube, and the neighboring parts of the sea.

ART. 18.—It is understood that the European Commission will have fulfilled its task, and that the bordering (*riveraine*) commission will have completed the works designated in the preceding article under the Nos. 1 and 2, within the space of two years. The powers parties to this treaty, assembled in conference and informed of these facts, will, after formally adopting them, pronounce the dissolution of the European Commission, and thenceforth the permanent bordering (*riveraine*) commission shall enjoy the same powers as those with which the European commission will have been invested up to that time.

ART. 19.—In order to assure the execution of the regulations which shall have been settled by common accord, upon the principles hereinbefore

enunciated, each of the contracting powers shall have the right at all times to station two light vessels at the mouths of the Danube.

ART. 20.—In exchange for the towns, ports, and territories enumerated in Article 4 of the present treaty, and in order the better to assure the liberty of the navigation of the Danube, his Majesty, the Emperor of all the Russias, consents to the rectification of his frontier, in Bessarabia.

The new frontier will start from the Black Sea at one kilometre to the east of Lake Mourna-Sola, will perpendicularly rejoin the Akerman-road, following this road as far as the valley of Trajan, pass to the South of Belgrade, re-ascend along the river Yalpuck, as far as Saasika, and will terminate at Yakamori on the Pruth. Above this point the old frontier between the two empires will undergo no modification.

Delegates of the contracting powers will settle, in its details, the boundary line of the new frontier.

ART. 21.—The territory ceded by Russia shall be annexed to the Principality of Moldavia, under the suzerainty of the Sublime Porte.

The inhabitants of this territory will enjoy the rights and privileges assured to the Principalities, and during the space of three years they shall be permitted to remove their domicil elsewhere, freely disposing of their property.

ART. 22.—The Principalities of Wallachia and Moldavia will continue to enjoy, under the suzerainty of the Porte, and under the guarantee of the contracting powers, the privileges and immunities of which they are in possession. No exclusive protection shall be exercised over them by any one of the guranteeing powers. There shall be no special right of interference with their internal affairs.

ART. 23.—The Sublime Porte engages to preserve to the aforesaid Principalities an independent and national administration, as well as full liberty of worship, legislation, commerce, and navigation.

The laws and statutes now in force shall be revised. To establish a complete accord as to this revision, a special commission, with regard to the composition of which the high contracting parties will come to an understanding, will assemble without delay at Bucharest, together with a commission of the Sublime Porte.

The task of this commission will be to inquire into the actual state and condition of the Principalities, and to propose the bases of their future organization.

ART. 24.—His Majesty, the Sultan, promises to convoke immediately in each of the two provinces, a divan *ad hoc*, composed in such a manner as to constitute the more exact representation of the interests of all classes of society. These divans are to give expression to the wishes of the populations relative to the definitive organization of the Principalities. An instruction of the Congress will regulate the relations of the commission with these divans.

ART. 25.—Taking into consideration the opinion expressed by the two divans, the commission will, without delay, transmit the result of its own labors to the present seat of the conferences. The final understanding with the suzerain power recorded in a convention concluded at Paris between the high contracting parties, and a hatti-scheriff, conformable to the stipulations of the convention, will definitively constitute the organization of these provinces—placed thenceforth under the collective guarantee of all the powers parties to the treaty.

Art. 26.—It is agreed that there shall be in the Principalities an armed national force organized with the object of maintaining the security of the interior, and assuring that of the frontiers. No impediment (*entrave*) is to be placed in the way of such extraordinary measures of defence, as, in accordance with the Sublime Porte, the Principalities may be called upon to take, to repulse any foreign aggression.

Art. 27.—If the internal tranquillity of the Principalities should be menaced or compromised, the Sublime Porte will come to an understanding with the other contracting powers, as to the measures to be taken to maintain or re-establish legal order. No armed intervention can take place without a previous agreement between these powers.

Art. 28.—The Principality of Servia will continue to be dependent upon (*à relever de*) the Sublime Porte, conformably to the Imperial Hatti, which fix and determine its rights and immunities placed henceforth under the collective guarantee of the contracting powers.

In consequence, the said Principality will preserve its independent and national administration, as well as full liberty of worship, legislation, commerce, and navigation.

Art. 29.—The right of garrison of the Sublime Porte, such as is stipulated for by anterior regulations, is maintained. No armed intervention is to take place in Servia, without a previous accord between all the contracting powers.

Art. 30.—His Majesty, the Emperor of all the Russias, and his Majesty, the Sultan, maintain in its integrity the state of their possessions in Asia, such as it existed legally before the rupture.

In order to prevent any local dispute, the boundary of the frontiers will be verified, and if need be, rectified, but so that no territorial prejudice shall result to either of the two parties from any such rectification.

With this view a mixed commission, composed of two Russian commissioners, two Ottoman commissioners, one French commissioner and one English commissioner, shall be sent to the locality (*sur les lieux*) immediately upon the re-establishment of diplomatic relations between the Court of Russia and the Sublime Porte. The labors of this commission are to be terminated within the space of eight months, dating from the exchange of the ratifications of the present treaty.

Art. 31.—The territories occupied during the war by the troops of their majesties the Emperor of the French, the Emperor of Austria, the Queen of the United Kingdom of Great Britain and Ireland, and the King of Sardinia, under the terms of the conventions signed at Constantinople on March 12, 1854, between France, Great Britain, and the Sublime Porte, and the 14th of June of the same year between Austria and the Sublime Porte, and the 15th of March, 1855, between Sardinia and the Sublime Porte, shall be evacuated as soon as possible after the ratification of the present treaty. The time within which the evacuation is to be effected, and the means of execution, will be the subject of a convention between the Sublime Porte and the powers whose troops occupy the territories.

Art. 32.—Until the treaties or conventions which existed before the war between the belligerent powers shall have been renewed or replaced by new acts, the commerce of importation and exportation shall go on reciprocally upon the footing of the rules in force before the war, and their subjects shall in all other respects be respectively treated upon the footing of the most favored nation.

ART. 33.—The convention concluded this day between their majesties, the Emperor of the French, the Queen of the United Kingdom of Great Britain and Ireland, of the one part, and of his Majesty, the Emperor of all the Russias of the other part, relative to Aland Isles, is and remains annexed to the present treaty, and shall have the same force and value as if it had made part of it.

ART. 34.—The present treaty shall be ratified, and the ratification shall be exchanged in Paris within the space of four weeks, or sooner if possible.

CONVENTIONS ANNEXED TO THE PRECEDING TREATY.

1.—*Convention between his Majesty, the Emperor of Austria, the Emperor of the French, the King of Prussia, the Emperor of Russia, and the King of Sardinia, on the one part, and the Sultan on the other part, respecting the Strait of the Dardanelles and of the Bosphorus.*

(Signed at Paris, March 30, 1856. Ratifications exchanged at Paris, April 27, 1856.)

In the name of Almighty God.

ART. 1.—His Majesty the Sultan, on the one part, declares that he is firmly resolved to maintain for the future the principle invariably established as the ancient rule of his empire, and in virtue of which it has at all times been prohibited for ships of war of foreign Powers to enter the Straits of the Dardanelles and the Bosphorus, and that so long as the Porte is at peace, his Majesty will admit no foreign ship of war into the said straits.

And their Majesties the Queen of the United Kingdom of Great Britain and Ireland, the Emperor of Austria, the Emperor of the French, the King of Prussia, the Emperor of all the Russias, and the King of Sardinia, on the other part, engage to respect this determination of the Sultan, and conform themselves to the principles above declared.

ART. 2.—The Sultan reserves to himself, as in past times, to deliver firmans of passage for light vessels under flags of war, which shall be employed as is usual in the service of the missions of foreign Powers.

ART. 3.—The same exception applies to the light vessels under flags of war which each of the contracting Powers is authorized to station at the mouths of the Danube, in order to secure the execution of the regulations relative to the liberty of that river, and the number of which is not to exceed two for each Power.

ART. 4.—The present convention, annexed to the general treaty signed at Paris this day, shall be ratified, and the ratifications shall be exchanged in the space of four weeks, or sooner if possible.

In witness whereof, the respective Plenipotentiaries have signed the same, and have affixed thereto the seal of their arms.

Done at Paris the 30th day of the month of March, in the year 1856.

[Here follow the signatures.]

2.—*Convention between the Emperor of Russia and the Sultan, limiting their naval force in the Black Sea.*

(Signed at Paris, March 30. Ratification exchanged at Paris, April 27, 1856.)

In the name of Almighty God.

ART. 1.—The high contracting parties mutually engage not to have in the Black Sea any other vessel of war than those of which the number, the forec and dimensions, are hereinafter stipulated.

ART. 2.—The high contracting parties reserve to themselves each to maintain in that sea six steam vessels of fifty metres in length at the line of flotation, a tonnage of 800 tons at the maximum, and four light steam or sailing vessels, of a tonnage which shall not exceed 200 tons each.

ART. 3.—The present convention, annexed to the general treaty, signed at Paris this day, shall be ratified, and the ratifications shall be exchanged in the space of four weeks, or sooner, if possible.

In witness whereof, the respective Plenipotentiaries have signed the same, and have affixed thereto the seal of their arms.

Done at Paris, the 13th day of the month of March, in the year 1856.

ORLOFF,
BRUNNOW,
AALI,
MEHEMMED-DJMIL.

3.—*Convention between his Majesty, the Emperor of the French, and the Emperor of Russia, respecting the Aland Islands.*

(Signed at Paris, March 30, 1856.—Ratifications exchanged at Paris, April 27, 1856.)

In the name of Almighty God.

ART. 1.—His Majesty, the Emperor of all the Russias, in order to respond to the desire which has been expressed to him by their Majesties, the Queen of the United Kingdom of Great Britain and Ireland and the Emperor of the French, declares that the Aland Islands shall not be fortified, and that no military or naval establishment shall be maintained or created there.

ART. 2.—The present convention, annexed to the general treaty signed at Paris this day, shall be ratified, and the ratifications shall be exchanged in the space of four weeks, or sooner if possible.

In witness whereof, the respective Plenipotentiaries have signed the same, and have affixed thereto the seal of their arms.

Done at Paris the 30th day of the month of March, in the year 1856.

CLARENDON.
COWLEY.
A. WALEWSKI.
BOURQUENEY.
ORLOFF.
BRUNNOW.

MARITIME LAW.

Declaration respecting Maritime Law, signed by the Plenipotentiaries of Great Britain, Austria, France, Prussia, Russia, Sardinia and Turkey, assembled in Congress at Paris, April 16th, 1856.

The Plenipotentiaries who signed the treaty of Paris, of the 30th of March, 1856, assembled in conference—

Considering—

That maritime law, in time of war, has long been the subject of deplorable disputes;

That the uncertainty of the law and of the duties in such a matter, gives rise to differences of opinion between neutrals and belligerents which may occasion serious difficulties, and even conflicts;

That it is consequently advantageous to establish a uniform doctrine on so important a point;

That the Plenipotentiaries assembled in Congress at Paris cannot better respond to the intentions by which their governments are animated, than by seeking to introduce into international relations fixed principles in this respect—

The above mentioned Plenipotentiaries, being duly authorized, resolved to concert among themselves as to the means of attaining this object; and, having come to an agreement, have adopted the following solemn declaration:—

1. Privateering is, and remains, abolished.

2. The neutral flag covers enemy's goods, with the exception of contraband of war.

3. Neutral goods, with the exception of contraband of war, are not liable to capture under enemy's flag.

4. Blockades, in order to be binding, must be effective—that is to say, maintained by a force sufficient really to prevent access to the coast of the enemy.

The Governments of the undersigned Plenipotentiaries engage to bring the present declaration to the knowledge of the States which have not taken part in the Congress of Paris, and to invite them to accede to it.

Convinced that the maxims which they now proclaim cannot but be received with gratitude by the whole world, the undersigned Plenipotentiaries doubt not that the efforts of their governments to obtain the general adoption thereof will be crowned with full success.

The present declaration is not, and shall not be binding, except between those Powers who have acceded, or shall accede, to it.

Done at Paris, the 16th of April, 1855.

[Here follow the signatures.]

OUR STATE ROOM.

The Macedonian.—By intelligence from Singapore, under date of Feb. 22nd, the Macedonian was there awaiting the arrival of her relief, the *San Jacinto*, when she would sail for the United States, having at that time been three years in commission; consequently, ere she arrives in the United States her cruise will have comprised nearly the full complement of four years, which seems to be the length of time adopted by the Department for keeping ships on that station—a practice which cannot be too strongly condemned. The *San Jacinto* arrived at Penang, March 22nd, and was to sail soon for Singapore.

Despatch Vessels in the Navy.—The *Brig-of-war Bainbridge* was *despatched* from Rio by Commodore Salter, on the 12th of March, in search of the crew of an American whaleship, said to have been cast away on Terra del Fuego, some eighteen months since.

A Steamer for the Home Squadron.—*One* is proposed in Congress as a coasting relief steamer! Between what points—how about the draft of water? What should the Home Squadron be, but a relief to the whole length and breadth of our Atlantic sea-coast? Steamships adapted to such service instead of winter quarters in a few deep harbors, would look like a navy for utility.

The British war steamer *Tartar*, Captain Dunlop, fell in with, relieved, and sent into port, the American ship *James Badger*, leaking badly, from Calcutta for London.

The U. S. Frigate Merrimac in Trouble.—We understand from good authority, that letters have been received by parties in Boston and Charlestown, from some of the crew of the steam frigate Merrimac, now at Annapolis, in which they mention that the boilers of the frigate have been damaged, in consequence of the Engineer letting the water get too low.—*Boston Traveller.*

The *Union* gives a *semi*-official contradiction to the reports relative to the boilers of the Merrimac being defective. Her machinery has been pronounced as eminently successful.

A correspondent of the *Herald*, referring to the report, says:

"I must, in justice to the contractor who furnished the machinery of this steamer, state the facts of the case, which are, that during the trip from Norfolk to Annapolis, the water in one of the boilers was allowed to get too low, and the boiler slightly burned in consequence.

"Owing to the large amount of heating surface and the rapid evaporation of this plan of boiler, they require much closer attention than the older forms, and the accident occurred during the watch of one of the junior assistant engineers. The repairs of the boiler were completed on Saturday last, and the steamer is now ready for sea."

We learn that a piece of false keel, supposed to belong to the U. S. S. Merrimac, has been fished up off Chamberlain's Wharf, where, it will be remembered, she ran aground coming up to her moorings, a few weeks ago.—*Norfolk News, 1st May.*

The U. S. Steam Frigate *Saranac*, on the Mediterranean Station, while at Spezzia, on the 12th ult., received orders to return to the United States. She was to sail, at once, from Leghorn direct for Philadelphia.

The Gun-Boat Fleet of England.—The *London Times* says, the invention of a gun-boat fleet as the mainstay and principal feature in a naval armament, is indeed a novelty in war. Like other discoveries, also, it has grown out of the necessities of the times. The practical efficiency of England's naval fleets, it says, must be computed by the number and equipments of the musquito swarm of minute vessels, and not by the squadrons of ships of the line. If these vessels are so available for attack, are they

not equally as serviceable in defending a harbor! One of the standing subjects of ridicule against Jefferson, used to be his recommendation of harbor defence by a gun-boat flotilla. Yet modern experience has brought one of the most ingenious nations of the world to adopt the gun-boat system as the most effective which can be employed in shallow waters.

NEW BOOKS.

History of the American Privateers. *See "The Great Naval Review."*

Lives of American Merchants. By Freeman Hunt, of the *Merchants' Magazine*—fills a space far too long vacant in American Biography. It purports to be the first vol. of a series of the Lives of deceased American Merchants, beginning with those immediately connected with the rise of our national commerce. In this Mr. Hunt has the assistance of some of the most eminent literary men in the country, and as they have the best possible subjects to concentrate their powers upon—the simple announcement of Peter Chardon Brooks, by Hon. Edward Everett; Thomas Pyne Cope, by Hon. Joseph R. Chandler; and twenty others of equal eminence, of both subject and author—the past and present personal history of our nation, here so eminently linked together, cannot fail to be sought, read, and remembered, as it should be, by every American capable of reading.

Home Cyclopedia, or Hand-Book of Chronology and History; A Dictionary of Dates: Putnam.

A *remembrancer* useful to every class of readers, and will not fail to interest any one who examines it;—a *manual encyclopedia* of eminent men and remarkable events, which will save a great deal of time to literary men in their researches for dates and things required for every kind of production.

OUR LOG BOOK.

ERRATA.—On page 164, second line—Instead of length, breadth and *width,* it should read length, breadth, and *depth.*

BROOKLYN.—*The Receiving Ship North Carolina* has been relieved of part of her battery, and consequently better adapted to her duty.

Orders.—Surgeon Abernethy, whose term of duty had expired, has been detached, and Surgeon Messersmith ordered in his stead. Lieut. Decatur detached, and Lieut's J. M. Duncan and J. W. Bennett ordered. *Chaplain* J. L. Lenhart detached, and *Chaplain* C. S. Stewart ordered in his stead. Lieut. R. Werden, at his own request, detached from the Observatory, and ordered to the *Yard*, in the place of Lieut. T. M. Brasher, also detached at his own request, and ordered to the Observatory.

PHILADELPHIA.—The *Susquehanna* sailed on the 16th ult. She is reported to have been much improved in her efficiency: new boilers, *some* minnie rifles, &c., but the same old pistols, lightning conductor and capstan.

Officers.—Captain—Joshua R. Sands.

Lieutenants.—J. N. Brown, J. C. Howell, Paul Shirley, Reuben Harris, S. L. Phelps, J. R. Hamilton. *Purser*—J. B. Rittenhouse. *Surgeon*—Ninian Pinkney. *P. A. Surgeon*—G. H. Howell. *Capt. of Marines*—H. W. Queen. *Engineers—Chief*, J. P. Whipple; *1st Ass'ts.*, E. Fithian, G. W. Alexander; *2d, do.* A. Henderson, E. D. Robie; *3d do.* A. Greer, W. H. Cushman, Glendy King. *Forward Officers—Boatswain*—T. G. Bell. *Gunner*—J. Hutchinson. *Carpenter*—W. M. Laighton. *Sailmaker*—J. S. Gallagher.

NORFOLK.—Captain T. A. Dornin has been ordered to the command of the Station, and entered upon his duties on the 14th ult.

The Merrimac discharged her pilot at 10 o'clock, 9th May, off Cape Henry, en route for Havana. As she is still on her trial trip—*mark time.*

The Portsmouth is the first U. S. vessel that ever left this port, having entirely dispensed with the spirit rations by the voluntary arrangement of the crew. She anchored in Hampton Roads, and commenced the practice of target firing the day before sailing, the 8th ult.

The surveying steamer Water Witch arrived on the 5th ult., from the river Plata, and its tributaries, and proceeded to Washington. The following is a list of her officers:

Commander—Thomas J. Page. *Lieutenants*—W. N. Jeffers, Wm. L. Powell, Wm. H. Murdaugh, E. W. Henry. *Ass't Surgeon*—Robert Carter. *Engineers*—Second Ass'ts., R. C. Potts, Wm. J. Lamdon. Third Ass'ts. T. B. C. Stump, P. H. Taylor. *Captain's Clerk*—E. R. Bushell.

Passed Assistant Surgeon, Wm. G. Carrington, has entered upon his duties at the Naval Hospital, vice passed Assistant Surgeon Thos. B. Steele, detached at his own request.

The United States ship Supply, with the camels contracted for by government for military service, arrived off Saluda, Texas, on the 30th ult. She was afterwards taken up the Mississippi to Port La Vaca, to discharge her live cargo.

RESIGNATION.—*Purser*—Josiah Tatnall.

APPOINTMENT.—W. A. Ingersoll, of Ct., to be *Purser* in the U. S. N. in the place of Tatnall, resigned.

DISASTERS AT SEA.

STEAMERS.

Minho, Liverpool for Barcelona, sunk off Tariffa, (no date,) 94 lives lost.
Northerner, Cleveland for Saginaw, sunk May 4th, crew saved.
Brothers, Cleveland for Windsor, C. W., sunk near the mouth of river Thames, May 4th.
Bay State, (Prop.,) sunk near Chicago, May 14th, crew saved.

SHIPS.

Wabamo, New-York, from Cardiff, lost some sails, &c. March 28th.
Woodcock, New-York for London, went ashore at Dungeness. April 1st.
Sentinel, Boston for New-Orleans, went ashore near the Hole in the Wall, April 4th.
Gentile, Boston for New-Orleans, went ashore near the Hole in the Wall, April 4th, total loss.
Harriet Hoxie, at New-York from Glasgow, lost some sails, &c.
Blanchard, Charleston for Bremen, was totally lost, April 15th, near Deal, England.
Compromise, at New-York from St Ubes, lost some sails, &c.
Stalwart, at Philadelphia from Liverpool, much damaged.
Hopewell, (whaler), was totally lost on the coast of California, Feb ——
Victoria, (Br), Baltimore, for Liverpool, put into New-York, May 3rd, much damaged.
Unknown, was seen ashore, April 23rd, near Cardenas.
Fairfield, at New-York from Havre, lost spars, sails, bulwarks, &c.
Reindeer, Melbourne for Shanghae, was totally lost, Oct. ——, crew saved.
Thessaly, (Br.), New-Orleans for Liverpool, was abandoned, March 17th, leaky.
Unknown, was seen May 2nd, water-logged, and abandoned
Adriana, Portland for San Francisco, was abandoned in a sinking condition, May 3rd.
Wm. Stetson, at New-York from Liverpool, lost some spars, &c.. May 3rd.
Mary Taylor, Talcahuano, for Australia, was wrecked on Eaod, Friendly Isles.
A. Kimball, Manilla for New-York, put into Singapore in distress, March 7th.
Unknown, was seen May 11th, with loss of spars, &c.
Wilson Kennedy, (Br.) Liverpool for St John, N. B., was abandoned May 10th.
Isaac Jeans, at San Francisco, from Philadelphia, leaking badly.
George Washington, (whaler), was burnt at Talcahuano, March, (total loss.)

BARQUES.

Wm. Larrabee, Cienfuegos for New-York, struck on Jardinell's Reefs, March 11th, is a total loss.
Justina, Baltimore for ——, lost mainmast, sails, &c.
Blake, (Br.), Ship Island Harbor, Miss. for Cork, was totally lost, March 13th, crew saved.
Kate Wheeler, Matanzas for Boston, put into Key West in distress, April 13th.
Victress, (Br), Marseilles for New-York, put into Malaga much damaged, April 2nd.
Marquis of Chandos, (Br.) at New-York, from Palermo, lost some sails, &c.
Unknown, was seen ashore on Pickle Reef near Key West, April 27th.
West Wind, in contact with steamer Mobile, lost spars, &c.
Adele, Savannah la Mar, for Amsterdam, abandoned in a sinking condition, April 6th.
Atlanta, (Br.), Androssan for Boston, put into Providence in distress, May 3rd.
Afrika, (Dutch) Charleston, for Amsterdam, put into Cowes, England, April 4th, much damaged.
Cabasa, Cienfuegos for Boston, was totally lost April 14th, on Abaco.
Mermaid, Bombay for China, was totally lost on Pratas Shoal, March 2nd.
Lucinda, Matanzas, was totally lost on the Chandeleurs, April 24th.
Robert and Emma, (Pruss.), at N. York, lost some spars, bulwarks, sails, &c.
Lowell, Bocadel Toro for Aspinwall, was wrecked at former place, April 24th.
John Murray, Buenos Ayres for Southampton, put back leaky.
Julian, San Francisco for Sydney, was totally lost on a small Island, called Scylla Island.

BRIGS.

S. B. Hill, Georgetown for Porto Rico, was burned April 17th, is a total loss.
George, Savannah for Boston, abandoned in a sinking condition, April 20th.
Houlton, Holmes' Hole for Philadelphia, put back, April 15th, leaking badly.
Zenobia, at Rio Janeiro for Valparaiso, in distress.
Maria (Dan.), New-York for Antwerp, put back very leaky, April 22nd.
Alcenus, Philadelphia for Bristol, R. I., put into Newport much damaged, April 25th.
Alma, (Norw.), Newcastle, England for Boston, at Fayal in distress, April 14th.
Ardent, (Fr.), was abandoned in a sinking condition, March 21st.
Cape Fear, New-York for Cienfuegos, was totally lost, March 2nd.
W. B. Nash, New-York for Sagua, went ashore near Silvy's, April 21st.

Sarah, Thorndike from Maracaibo, lost some sails, &c., April 21st.
Enoch Benner, at Boston, from Guayama, lost some sails, &c.
Mary Elizabeth, Baltimore, for Buenos Ayres, put into St. Thomas, April 16th, in distress.
Argo, (Br.) New-York for St. John's, N. F., was totally lost, April 20th.
Laura, (Br.), Baltimore for Port Rush, Ireland, put in Halifax, April 25th, much damaged.
Doctor Kneep, (Prus.), New-York for Dantzic, put into Portsmouth, England, much damaged.
Boston, Boston for Wilmington, N. C., put into Charleston in distress, May 8th.
Jonathan Cilley, from New-Orleans, put into Mobile, May 4th, leaky.
Abrasia, Darien for Barcelona, put into Bermuda in distress, April.
G. T. Ward, at St. Mark's, lost mainmast, April 23rd.

SCHOONERS.

Mary J. Hoyt, Philadelphia, for Rio Janeiro, put into St. Thomas' in distress, April 1st.
R. B. Pitts, New-York for Portland, was run into by Schr. Forest, and dismasted, May 2nd.
Vermont, Philadelphia for Boston, was totally lost off Long Island, May 8th, crew saved.
Sea Bird, Galveston for New-York, put into Key West in distress, April 14th.
Merchant, (Br.), Baltimore for Halifax, was seen dismasted, abandoned and water-logged, May 3d.
Skimmer, was totally lost in Brazos River, S. A. May.——
Jamestown, at Baltimore from Kingston, Ja., lost some sails, &c.
Tanner, Boston., for Mobile, put into Newport in distress. May 9th.
Merced, from Jeffries Ledge, was totally lost on Cape Neddick, May 9th.
White Foam, at Providence from Baltimore, in distress, April 8th.
Sarah, New-Bedford for Calais, sunk at Holmes' Hole, May 12th.
Kalos, Eastport for Alexandria, lost some spars, and put into Newport, May 10th.
Miranda, Norfolk for Wareham, put back in distress, April 19th.
Ann Osborn, Fredericksburg, for Providence, put into Norfolk in distress, April 19th.
Louise, Boston for Mobile, put into New-York, in distress, April 25th.
E. G. Diverty, Philadelphia, for Lynn, sunk April 21st, off Montauk, crew saved.
Herald, (Br.), Halifax, N. S. for Wilmington, N. C., went ashore on Throgg's Point, April 21st. is a total loss.
Unknown, was seen sunk April 21st, off Brigantine Shoals.
Henrietta, at New-Bedford from Baltimore, lost deck-load, April 15th.
Robert Miller, of St. George, went ashore on Fire Island, April 23rd.
Hylas, Boston for Bath, went ashore on Wood Island, April 27th, much damaged.
Sarah Adelaide, Norfolk, for Rum Gay, was totally lost on St. Salvador Island, April 6th.
Sea Bird, Galveston for New-York, put into Key West in distress, April 14th.
Edward Everett, Alexandria, Va., went ashore on Long Branch, May 1st.
Eliza Ann, was seen March 29th, waterlogged and abandoned
Maria Pike, New-York for Galveston, was seen May 6th, with loss of sails, &c.
A. J. Horton, Philadelphia for Roxbury, put into Holmes' Hole, leaky, May 12th.
New-Zealand, at Providence from Calais, lost deck-load, May 9th.
R. M. De Mill, ran ashore May 16th, on the rocks, New-Bedford harbor.
Belle Rose, Bonfouca for New-Orleans, was totally lost in Lake Pontchartrain, May 7th.
New-Jersey, Norfolk for Philadelphia, put back with loss of some spars, May 14th.
F. W. Johnston, Wilmington, N. C., for New-York, struck something near the Swash, and sank, April 28th.
Cornelia, New-York, for New-Bedford, got ashore on Blackwell's Island, and sank, May 17th.
Fair Hibernian, (Br.), Newfoundland, for Boston, was lost, May 9th, crew saved.

LAUNCHES.

At Portsmouth, N. H., April 24th, by G. Raynes, Esq., Ship Jumna, of 800 tons.
At Augusta, April 23d, schooner Brazil, of 120 tons.
At Quebec, May 6th, by J. J. Nesbitt, Esq., ship Glen Isla, of 1111 tons.
At Quebec, May 6th, by Messrs. Jubin & Lane, brig Young King, of 200 tons.
At Quebec, May 4th, by E. Trahan, Esq., a ship of about 1000 tons.
At East Machias, April 21st, by Messrs. Talbot & Son, schooner Sahwa, 185 tons.
At Damariscotta, April 23d, ship B. D. Metcalf, of about 1300 tons.
At Marblehead, April 19th, schooner Philip Bridges, of 106 tons.
At Richmond, Me., April 22d, by G. Ferrin, Esq., ship Brazil, of 666 tons.
At Charlestown, April 24th, ship Expounder, of 1100 tons
At Brewer, April 21st, by D. C. Oakes, Esq., schooner West Wind, of 180 tons.
At Medford, April 25th, by Messrs. Hayden & Cudworth, ship Thatcher Magoun, of 1200 tons.
At Medford, April 25th, by Mr. Foster, ship Addie Snow, of 1000 tons.
At Hallowell, April 26th, a ship of 850 tons,
At Kennebunk, April 22d, by Messrs. Edmonds & Littlefield, schooner Oak Leaf, of 95 tons.

At Kennebunk, April 24th, by Messrs. D. & S. Ward, schooner Nile, of 91 tons.
At Baltimore, April 26th, by Messrs. Cooper & Butler, barque Smallwood, of 470 tons.
At Robinson, Me., by J. N. M. Brewer, Esq., brig Broome, of 209 tons.
At Wiscasset, April 23d, by E. H. Wood & Co, a brig of 265 tons.
At East Haddam, Conn., schooner Sydney C. Jones, of 240 tons.
At Richmond, Me., May 1st, ship Kasan, of 675 tons.
At Bowdoinham, April 21st, by M. Berry, Esq., ship Sea Dog, of —— tons.
At Warren, Me., May 3d, ship Byzantium, of about 1000 tons.
At Newburyport, April 19th, by J Merrill, Esq., a barque of about 300 tons.
At South Dartmouth, May 3d, by Messrs. Matthews, Mashaw & Co., a barque of 300 tons.
At Mattapoisett, May 3d, by J. Holmes, Jr., & Co., a barque of about 340 tons.
At Quebec, May 3d, by Messrs. Baldwin & Diming, ship Elizabeth Yeo, of 925 tons.
At Fairhaven, Mass., May 6th, a ship of 446 tons.
At New-York, May 6th, by Thomas Collyer, Esq., barque Roebuck, of —— tons.
At Brewer, Me., May 6th, by J Dunning, Esq., schooner Malakoff, of 240 tons.
At New Bedford, May 3d, by Messrs. Damon & Co., a barque of 380 tons.
At Augusta, Me., April 29th, schooner Adeliza, of 125 tons.
At Frankfort, April 22d, by C. Dunham, Esq, barque France, of 650 tons.
At Brunswick, Me., May 12th, by Samuel Dunning, Esq, ship Consignment, of 1160 tons.
At Essex, May 6th, schooner Montezuma, of 95 tons.
At Bangor, May —, by T. Crosby, Esq, schooner Hannibal, of 175 tons.
At Cleveland, May 10th, by Messrs. Bidwell & Banta, schooner Ostrich, of 350 tons.
At Cleveland, May 9th, schooner Goldfinch, of 384 tons.
At Cleveland, May 13th, by Bidwell & Banta, propeller Ontanagon.
At Buffalo, May 16th, by Messrs. Van Slyck, Notter & Co., schooner Wm. Fiske, of 490 tons.
At L' Islet, May 5th, by J. B. Dusseault, Esq., schooner Cecile, of 90 tons.
At Bath, May 17th, by Messrs. E. & A. Sewall, ship Hellespont, of 750 tons.
At Petty's Island, May 16th, by Messrs. Bishop, Simons & Co., ship John Truck of 800 tons

SALES OF VESSELS.

Brig Amanda Jane, at Boston, 1 year old, 277 tons, $10,000.
Barque Rajah, at New Bedford, 250 tons, for $5.000.
Ship James Drake, built at New-York, 484 tons, 7 years old, for $33,000.
Ship M. O. Roberts, built at Robinston, Me., 864 tons, for 240.000f.
Schooner Harbinger, at Boston, 127 tons, March 21st, for $2,500.
Seven-eighths of Ship Gazetteer, built at Rockland, Me., in 1854, 1100 tons, at auction, for $42,500.
Ship Planter, built at Pembroke, Me., in 1855, 1904 tons, at auction, for $10,000 cash.
Brig Melvin, built at Richmond, Me., in 1855, 242 tons, at auction, for $6,500, half cash.
Ship Russell, built at Richmond, Me., 20 months old, 706 tons, for $35,000 cash.
Schooner West Wind, built at Dennis, 1 year old, 128 tons, for $5,200.
Ship Western Continent, built in 1853, 1272 tons, at auction, April 8th, for $42,500.
Ship C. C. Dow, at New-York, 528 tons, for $20.000.
Ship Alfred Hill, at Boston, 549 tons, for about $32,000.
Barque Velocity, built in Massachusetts, 9 years old, 256 tons, for $6,250.
Ship Logan, built at East Boston, 1700 tons, for about $95,000.
Steamer Fairy Queen, March 31st, for $12,000
Five-eighths of Ship Connecticut, 6 years old. 1080 tons, at auction, for $49,600.
Schooner Clarion, 80 tons, at auction, for $700, cash
Schooner Dragonet, 53 tons, 2 years old, for $2,500, cash.
Barque Phœnix, built at Baltimore, 9 years old, 220 tons, for $8,500 cash.
Ship Arcadia, built at Boston, in 1854, 703 tons, at auction, for $31,000.
Brig Adelphi, built at Charlestown, Mass., 8 years old, 180 tons, for about $7,000.
Schooner Juanita, built at Biddeford, Me., 3 years old, 137 tons, for $5,000.
Barque D. S. Goodell, 232 tons, at auction, for $2,500 cash.
Ship Josiah Quincy, 472 tons, for about $16,500.
Ship Cygnet, 498 tons, 11 years old, for $1,800.
Barque Rose Pool, of Boston, 285 tons, for $8,250
Barque Gallego, built at Fairhaven, in 1847, for $14,500 cash.
Ship Denmark, of Warren, R. I., 512 tons, at auction, May 10th, for £2,500.
Three-fourths of Ship Huntress, at Boston, 667 tons, at auction, April 22d, for $12,500, cash.
Ship Anna Tift, at Havana, at auction, April 28th, for $3,415.
Ship Levant, of Sag Harbor, 382 tons, for $10.500.
Barque Montpelier of Gloucester, 264 tons, at auction, April 24th, for $3.200.

Schooner Cyclone, at Nantucket, at auction, April 22d, for $2,950.
Schooner Medora, 200 tons, 4 months old, at auction, April 22d, for $6,925, cash.
Schooner Mary Alice, built at Machias, 180 tons, for $8,000.
Barque Lamplighter, built at Calais, in 1854, 279 tons, at auction, for $8,000.
Barque Fanny, built at Mystic, in 1849, 240 tons, at auction for $12,000.
Barque D. M. Hall, at San Francisco, 293 tons, at auction, April 2d, for $3,200.
Brig Harp, built at Egg Harbor in 1843, 162 tons, for $—— .
Schooner Falmouth, built at Dorchester in 1850, 105 tons, at auction, for $3,500.
Schooner Perseverance, 58 tons, for $320, cash.
Schooner Edward King, of Dorchester, 117 tons, at auction, May 3d, for $1500, cash.
Barque Mary & Jane, built at Pittston, 14 years old, 340 tons, for $5,500.
Ship Adam Lamont, (wreck), at Cardenas, at auction, the hull for $3,000, sails, rigging, &c., for $10,000.
Ship Telegraph, at Savannah, at auction, for $6,200.
Brig St. Leon, 6 years old, 150 tons, at auction, May 16th, for $4,000.
Sold recently by Messrs. Harris & Morgan, to the Southern Steamship Co., of New Orleans :—
Steamer C. Morgan, for $120,000.
Steamer Louisiana, for $80,000.
Steamer Mexico, for $80,000.
Steamer Perseverance, $60,000.
Steamship Ocean Bird, and Steamboat St. Lawrence were sold for $200,000.
Schooner Angier. 86 tons, at auction, at Boston, May 16th, for $1,400, cash.
Steamer Wm. Penn, built at Philadelphia, 7 years old, 600 tons, for £7,000.
Steamer Eagle, at New-York, 300 tons, at auction, May 15th, for $16,150 cash.
Three-fourths of .... Georgina, built at Owl's Head, 8 months old, 275 tons, at auction, May 17th. for $6,600.
At Buffalo, by E. K. Bruce, the following :—Schooners Nicaragua, Granada, and S. H. Lathrop at $17,000 each.

NOTICES TO MARINERS.

Primary and secondary Sea-coast Lights of the Atlantic Coast, corrected to January 1, 1856.

NOTES.

The lights are arranged in their regular geographical order, commencing at the first light nearest to the Northeastern boundary of the United States; following the sea-coast to the entrances of the several sounds, bays, rivers, &c.; following each of these with the next coast light in its order.

The names of the lights are printed as follows, viz;

1st. PRIMARY SEA-COAST LIGHTS.

2d. Secondary sea-coast lights.

3d. *Light-vessels.*

In the column of "distances visible in nautical miles," will be found the greatest distances at which the lights can be seen under ordinary states of the atmosphere, from observers a elevations of fifteen feet above the level of the sea.

REFERENCES.

F.=fixed lights.
Rev'g=revolving lights.
F. V. F.=fixed lights varied by flashes.
Flasgh'=flashing lights.
[⊙1]=First order lens lights.
[⊙2]=Second order lens lights.
[⊙3]=Third order lens lights.
[⊙4]=Fourth order lens lights.
[⊙5]=Fifth order lens lights.
[⊙6]=Sixth order lens lights.

List of Primary and Secondary Sea-coast Lights and Light-Vessels of the United States, of the Atlantic Coast, corrected to January 1*st*, 1856.

Name.	Location.	Latitude North.	Longitude west.	Number of lights and relative positions.	Fog Signal.	Fixed or Revolving, &c.	Interval of revolution or flash.	Distance visible in nautical miles.	Color of tower or vessel.	Height of tower from base to centre of lantern.	Height of light above sea level.	Size of lens.	Size of reflectors.	Number of lamps.	Remarks.
		D. M. S.	*D M. S.*				*M S*					*Order.*	*In.*		
oose Peak.........	On Mistake Island, S. W. of west entrance to Bay of Fundy, Me.	44 28 00	67 31 09	1	......	Revolv'g	2 00	14	White.	40	65	......	21	10	Guide to Moose a Bec Harbor.
..he's Island........	Off the mouth of Pleasant River, (east side,) Me.	44 27 00	67 43 00	1	.....	Fixed, red.	....	12	White.	28	47	[⊙ 4]	...	6	Red light; at W. end of Moose a Bec Reach.
Petit Menan.	On south end of island of that name, Me.	44 22 00	67 52 00	1	Bell. .	F. V. F.	2 00	17	Grey.	109	125	[⊙ 2]	...	..	Fog-bell. There are dangerous ledges, distant from 2 to 5 miles on different bearings from this light.
Mount Desert.......	On Mount Desert Rock, Me.	43 58 30	68 08 00	1	Bell...	Fixed.	....	14	Grey.	50	65	......	21	8	Twenty miles south-southeast of Mt. Desert Island, 27 miles from Petit Menan light, and 33 miles from Matinicus light. Fog-bell rung by machinery.
B ker's Island.........	Off Mount Desert island, and south of the entrance to Frenchman's Bay, Me.	44 13 30	68 08 00	1	......	F. V. F.	1 30	17	White.	30	105	[⊙ 4]	....	..	Guide to Cranberry Island Harbor.
Saddleback Ledge......	Near southwest end of Isle au Haute, and east side of entrance to the bay, Me.	43 59 00	68 36 30	1	......	Fixed.	...	13	Grey.	36	51	......	15	5	Dangerous ledges for nearly the whole distance between this light and Carver's Harbor.
Matinicus Rock......	Off Penobscot Bay, Me.	43 46 30	68 49 00	2 1 light on each end of keeper's house.	Bell...	2 Fixed.	....	14½	Grey.	39	76	......	21	7 7	This light is 33 miles from Mount Desert Rock-light, and 39 mls. from Seguin Island light. Fog-bell rung by machinery.
Whitehead.............	On Whitehead Island, southwest of west entrance to Penobscot Bay, Me.	43 57 00	69 04 00	1	Bell...	Fixed.	....	13	Grey.	34	70	[⊙ 4]	....	..	Fog-bell at this light, which is struck every 5 seconds.
Manheigen Island......	On Manheigin Island, Me.	43 44 00	69 15 00	1	......	Revol'g, red and white.	2 15	19	Grey.	36	175	.....	21	10	This is a revolving red and white light, is 19 miles from Matinicus, and 22 miles from Seguin Island light.
Pemaquid Point........	At southwest entrance to Bristol Bay, and east of entrance to John's Bay, Me.	43 48 00	69 29 00	1	. ....	Fixed.	....	14½	White.	32	75	......	14	9	

32	SEGUIN	On Seguin Island, off the mouth of the Kennebec river, Me.	43 41 36	69 44 00	1	....	Bell...	Fixed.	....	19	White.	24	170	......	21	15	This light is 39 miles from Matinicus Rock light, 46 miles from Boon Island light, and 21 miles from Manheigin and Cape Elizabeth lights—fog-bell.
33	CAPE ELIZABETH	On Cape Elizabeth, south southeast of Portland, Me.	43 33 50	70 11 36	2	300 yds. apart.	Bell...	Fixed & revolv'g.	1 30	17	White. White.	53 53	143 143	....	21 21	15 10	Fog-bell—struck by machinery.
38	BOONE ISLAND	On west part of Boone Island, off York Harbor, Me.	43 07 16	70 28 16	1	....	.....	Fixed.	....	17½	Grey.	123	133	[⊙ 2]	....	..	This light is 46 miles from Seguin light, and 30 miles from the two lights on Thatcher's Island, Cape Ann.
41	Isle of Shoals	On White Island, the southwest Island of the Isle of Shoals, off Portsmouth, N. H.	42 58 00	70 37 04	1	....	......	Revol'g, red and white.	1 30	15	White.	40	87	......	21	10	Alternate red and white flashes.
46	CAPE ANN	On Thatcher's Island, distant about two miles from Cape Ann, Mass.	42 38 19 42 38 12	70 34 10 70 34 11	2	2,000 ft. apart. N. by E. ¾ E. & S. by W. ¾ W.	......	2 fixed.	....	16	White.	45	98	......	21 21	11 11	Two stone towers. Cape Ann forms the northernmost limit of Massachusetts bay. These lights are 30 miles from Boone Island light, 24 mls. from Boston light, and 43 miles from Cape Cod (*Highlands, Truro,*) light.
53	*Minot's Ledge Light-vessel.*	Off the outermost of the Cohasset rocks, about 9 miles southeast ¼ east from Boston light	42 16 09	70 45 14	2	....	Bell...	2 fixed.	....	12	Straw color.	....	45 45	....	12 12	8 8	Anchored in 15 fathoms off Minot's ledge; fog-bell on board.
54	BOSTON	On the Little Brewster Island, north side of main outer entrance to Boston harbor, Mass.	42 19 39	70 53 05	1	....	Bell...	Revol'g.	1 30	16	White.	69½	87½	......	21	14	Rough stone circular tower, fog-bell; lantern, straw color.
65	CAPE COD BAY, (Highlands, Truro.)	On the seaward side of Cape Cod, (Highlands,) Truro, Mass.	42 02 24	70 03 18	1	....	......	Fixed.	....	20	White.	36	171	......	21	15	Brick tower; lantern, straw color; 43 miles from Cape Ann lights, 45 mls. from Sankaty Head light, and 41 miles from Boston light.
69	*Pollock Rip Light-vessel.*	Off Chatham, 4 miles east ½ south from Monomoy lighthouse.	....	....	1	.. ..	Bell..	Fixed.	....	12	Red.	30	45	......	12	8	Fog-bell; one red hoop iron day-mark at the mast-head. A north ½ east course (mag.) from near this vessel, if made good, will clear the shoals. The black buoy, distant half mile north by east from the vessel, must be left on the port hand.
70	*Shovelful Shoals Light-vessel.*	Off Chatham, 2¼ miles S. S. W. ¾ west from Monomoy Point light-house.	....	....	1	....	Bell...	Fixed.	....	11	Green.	28	40	......	12	8	Fog-bell; one red hoop-iron day-mark at mast-head. This vessel lies W. from Pollock Rip light-vessel. There is a black buoy near this on the point of the Shovelful shoal.
72	*Bishop and Clerk's Light-vessel.*	Between Bishop and Clerk's and Middleground shoals, Vineyard Sound.	....	....	1	....	Bell...	Fixed.	....	10	Straw color.	28	40	......	12	8	Moored in about 4½ fathoms water, nearly midway between Bishop and Clerk's and Middle Ground Shoals. Bass River light bears from this sta- N.E. ½ E. (mag.) Point Gammon light, N. by E. East end of Hyannis Harbor breakwater, N. ¾ W. Succonesset light-vessel, W. ½ S.

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			D. M. S.	D. M. S.				M. S					Order.	In.		
72	*Bishop and Clerk's Light-vessel.* [Continued.]	Between Bishop and Clerk's and Middleground Shoals, Vineyard Sound.	....	....	1	Bell..	Fixed.	....	10	Straw color.	28	40	......	12	8	Buoy on south part of Handkerchief, S E by E. Schooner rigged; two hoop-iron day-marks (one at each mast-head) painted black. Hull painted straw color, with the words, "Bishop and Clerk's" in large black letters on each side.
73	*Succonnesset Shoal light-vessel.*	Between Succonnesset shoal and Eldridge shoal, Vineyard sound.	....	....	1	Bell...	Fixed.	....	10	Alternate sqs of red and cream color.	28	40	.... .	12	8	Moored in mid-channel, in 6 fathoms water; schooner rigged, with two red hoop-iron day-marks. Cape Poge light bears S. by W (mag.); West Chop light bears W. by S.; Nobsque light bears W. ½ N.; buoy N.W. end Horse Shoe shoal, E. ¾ S.
74	Nantucket, (Gt. Point.)..	On Sandy or Gt. Point, the N. E. extremity of Nantucket Island.	41 23 24	70 02 25	1	.....	Fixed.	....	14	White.	60	70	......	21	15	Stone tower; lantern black.
75	SANKATY HEAD.........	On the southeast extremity of the Island of Nantucket, about S. by W., 23 miles from Pollock light-vessel.	41 16 59	69 57 35	1	......	F. V. F	1 00	20	White red, & white.	65	150	[⊙ 2]			This light shows a brilliant flash of ten seconds' duration, once in every minute, and a fixed light during the remaining 50 seconds, within the range of visibility of the fixed light. Cape Cod light, 47 miles; and Gay Head light, 39 miles distant from this light.
76	*Nantucket New South Shoals light vessel.*	Placed about two miles south of the southern extremity of Davis' New South shoal, off Nantucket, in 14 fathoms water.	40 56 30	69 51 30	2	Bell & guns.	2 fixed.	....	12	Red.	34	44	......	12 12	8 8	Magnetic bearings from light-vessel to Old South shoal, N. by E., distant 8 miles. Tom Never's head, N.N.W. ¼ W., distant 21 miles. Block Island light, W.N.W., distant 78 miles. Sandy Hook light vessel W., distant 180 miles. This light-vessel is schooner-rigged,

																	has two hoop-iron day-marks (one at each mast-head) painted red. Hull painted red, with the words, "South Shoals," in white letters, on each side. Fog-bell and signal guns.
77	GAY HEAD*..........	On the western extremity of Martha's Vineyard Island.	41 20 52	70 49 48	1	....	......	Revol'g.	1 30	20	White	35	191	......	21	14	A guide to Vineyard's Sound, and Buzzards' bay, 39 miles from Sankaty Head light, 48 miles from Montauk Point light, and 30 miles from Point Judith. A rocky shoal, distant 1¼ miles, lies northwest from this light. Cuttyhunk island bears north 45° west, distant 7½ miles. "Sow and Pigs" light vessel bears W.N.W., distant about 7 miles.
80	*Cross Rip light-vessel*...	Northwest of Nantucket, off Tuckanuck shoal, Mass.	41 26 44	70 17 05	1	....	Bell...	Fixed.	....	7	Straw color, with red st.	....	39	......	12	8	This vessel lies in 8 fathoms water; is sloop-rigged, with a red hoop-iron day-mark at mast-head; has a fog-bell; a black buoy, 300 fathoms distant, bearing S.W. by S. (mag.) lies in 18 feet water.
90	*Vineyard Sound light-vessel.*	Near the rocks called "Sow and Pigs," 13½ fathoms water. Cuttyhunk light N. E. ¼ E., Gay Head E. S. E., Dumpling Rock, N. N. E ¼ E.	....	......	2	....	Bell...	2 fixed.	....	7	Red, with straw color streak.	....	34 23	......	12 12	8 8	Fog-bell: day-marks, two balls color of the vessel. A dangerous rock lies on the range between the vessel and Dumpling light, called Ribbon Reef, marked by a red and black horizontal striped buoy.
91	Sow and Pigs..........	On the rocks, called the "Sow and Pigs," off the end of Cuttyhunk Island, Mass.	....	....	1	....	......	......	....	....	......	....	....	......	....	.	Building.
99	*Brenton's Reef light vessel.*	Off east entrance to Newport, R.I.	....	.... ..	2	....	Bell...	2 fixed.	....	12	Straw color.	....	50 40	......	N'e.	2	Moored in 13 fathoms water; painted straw color, with "Brenton's Reef," in black letters on each quarter; fog-bell. Point Judith light bears southwest ¼ west; Beaver Tail, northwest; Castle Hill Point, north by east.
100	Beaver Tail............	On south point of Conanicut Island, entrance to Newport, R.I.	41 26 54	71 23 39	1	....	......	Fixed.	....	15	White.	74	96	......	15	15	
109	Point Judith..	On southeast point of Narragansett shore, R. I.	41 21 36	71 28 36	1	.. ..	......	Revol'g.	1 30	12½	White.	46	67	......	21	10	Between and nearly in range with Beaver Tail and Block Island lights.
110	Block Island...........	On north end of Block Island.	41 13 24	71 34 12	2	On each end of keeper's house.	......	2 fixed.	....	12	White.	34	50	......	14 14	6 6	Off the eastern entrance to Long Island Sound.
111	Watch Hill............	On Watch Point, about two miles S. E. of Stonington, Conn.	41 18 12	71 51 12	1	....	......	Fixed.	....	12½	Granite	40	62	[⊙ 4]	....	..	Tower attached to southeast corner of dwelling.
112	MONTAUK..............	On the extreme east end of Long Island, N. Y.	41 04 14	71 51 06	1	....	......	Fixed.	....	18½	White.	85	160	......	21	15	Forty-seven miles from Gay Head light, and 66 miles from Fire Island light.

* A new tower built—to be fitted with a first order lens.

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			D. M. S.	D. M. S.				M. S					Order.	In. N'e.		
118	*Bartlet's Reef light-vessel.*	Off New-London, Conn.			2	Bell...	2 fixed.		10	Straw color.		28 35			2	Fog-bell. Vessel painted black, with a white streak, and name of station on each quarter, in white letters.
141	Great West Bay	On Long Island, on Pondquogue Point, north side of Shinnecock bay, and about midway betw'n Montauk and Fire Island light-houses.			1											Building.
142	Fire Island	On east side of Fire Island inlet, south side of L. Island, N. Y.	40 37 54	73 12 48	1		Revol'g	1 20	15	White.	74	89		21	14	Thirty-seven miles from Highlands of Navesink lights; 31 miles from Sandy Hook light-vessel, and 66 miles from Montauk light-vessel.
143	*Sandy Hook light-vessel.*	Off entrance to New-York bay, 6 miles from Sandy Hook and Highlands of Navesink lights.			2	Bell...	2 fixed.			Red.		45 45		12 12	8 8	Fog-bell. Vessel painted red, with name of station on each side, in large white letters.
144	Highlands of Navesink.	On the Highlands of Navesink, N. J.	40 23 42	73 58 48	2 100 yds. apart.		Fixed and revolv'g.	 0 30	22 22	White. White.	40 40	248 248	⊙ 1 ⊙ 2			Two towers and two lights, one 1st order fixed lens, and one 2d order revolving lens; north light, fixed; south light, revolving.
145	Sandy Hook	South side of entrance to New-York bay N. J.	40 27 39	73 59 49	1		Fixed.		15	White.	77	90		21	16	To mark the entrance to, and ranges for, the channels of New-York bay.
146	East Beacon	On north point of Sandy Hook			1	Bell...	Fixed.			White.		35		21	6	Fog bell, struck by machinery seven times a minute.
147	West Beacon	On the bay side of Sandy Hook, N. W. of Main light.			1		Fixed.			White.		35	⊙ 6			
174	Barnegat	South side of Barnegat inlet, on north end of Long Beach, N. J.	39 46 00	74 06 00	1		Fixed.	..	12	White.	40	54	⊙ 4			Thirty-seven miles from the lights on the Highlands of Navesink, and 18 miles from Tucker's Beach (Little Egg Harbor) light-house.
176	Absecom				1											Building
177	*Five-Fathom Bank light-vessel.*	Sixteen miles from Cape May, N. J., near the shoal called the "Five Fathom Bank."	38 53 30	74 39 00	2 1 on each mast	Bell...	2 fixed.		10	Straw color.		40 45		12 12	8 8	Fog-bell—name painted on each side of the vessel.
178	Cape May	On the north side of entrance to Delaware bay, N. J.	38 55 50	74 57 16	1		Revol'g	1 20	14	White.	74	84		21	15	Sixteen miles from Five-Fathom light-vessel.
179	Cape Henlopen	South side of the entrance to Delaware bay, Del.	38 46 38	75 04 43	1		Fixed.		19	White.	69	180	⊙ 1			There are large white sand-hills close to this light-house. It is 21 miles from Five-Fathom light-vessel.

195	ASSATEAGUE	About two miles from the south-west point of Assateague Island, Va.	37 54 37	75 21 03	1	....	......	Fixed.	....	14	White.	45	80	....	14	14	The centre of Winter Quarter shoal bears east by north ¾ north, (mag.) distant 11½ nautical miles, and the Chincoteague shoals, from the southward to east-southeast, about 5 nautical miles from the Assateague lighthouse.
197	CAPE CHARLES	Near New Inlet, on the northeast end of Smith's Island, (Cape Charles,) Va.	37 07 47	75 52 12	1	....	......	Revol'g.	1 30	14	White.	61	69	......	21	10	
198	CAPE HENRY	On the south side of the main entrance to Chesapeake bay, Va.	36 55 28	76 00 11	1	....	Bell...	Fixed.	....	17½	White.	82	129	......	21	18	Fog-bell, struck by machinery seven times a minute; on open frame-work, near the beach.
240	CAPE HATTERAS	About two miles north of the southern extremity of the point of the cape.	35 15 11	75 30 33	1	....	......	Flash'g	0 15	19	Grey & red.	140	150	[⊙ 1]	....	..	A first order lens, showing 4 flashes and eclipses in every minute. There is a flash of 6 seconds' duration, followed by an eclipse of 9 seconds duration, in every 15 seconds of time. The duration of the flash will be somewhat less, and that of the eclipse proportionally increased, at distances over 14 miles. From the Base of the tower to the height of 20 feet, it is GREY, and the remainder RED. Dangerous shoals, with 9 feet water over them, lie in a southeasterly direction from the light, at the distance of 9 to 10 nautical miles.
255	CAPE LOOKOUT	Near the extremity of the cape, N. C.	34 37 20	76 30 41	1	....	......	Fixed.	....	16	White and red horizo'l stripes.	96	104	......	21	13	Tower painted with white and red horizontal stripes.
256	Bogue Banks Beacon	At Fort Macon, Beaufort, N. C. Main light in the rear, and beacon in front of the fort.	34 41 43	76 40 00	2	....	......	Fixed	....	13 10	Brick. Wood.	....	50 30	[⊙ 4] [⊙ 6]	....	.. ..	Lights in range with outer buoy; channel changes frequently.
257	Federal Point	On the north side of the inlet, north entrance to Cape Fear river, N. C.	33 58 04	77 54 53	1	....	......	Fixed.	....	12	White.	37	46	[⊙ 4]	....	..	About 9 miles to the northward of the main entrance into the Cape Fear river, at Bald Head.
258	*Frying-Pan Shoals light-vessel.*	In 10 fathoms water, off the end of the Frying-Pan shoals, off Cape Fear, N. C., 1 mile beyond the outer 18-feet shoal.	33 35 00	77 50 00	2	1 on each mast	Bell...	2 fixed.	....	12	Yellow	....	40 40	....	12 12	8 8	Hull yellow, with "Frying Pan Shoals painted on each side in black letters: lower masts, yellow; top-masts, white; day-mark black; Cape Fear (Bald Head) light-house bears north northwest, one-half west, and Federal Point light-house N. by W. (mag.) dis. from Cape Fear lighthouse about 19 naut. mls.
259	CAPE FEAR	On Bald Head, near the southern or main entrance to the Cape Fear river, N. C.	33 52 18	77 59 49	1	....	......	Fixed.	....	16	White.	92	107	[⊙ 3]	....	..	This light is about 4 mls from the pitch of the cape, and about 19 nautical miles distant, from 10 to 11 fathoms water, off the Frying Pan shoals.
266	Georgetown	On the south end of north Island, east side of the entrance to the Pedee river, and to the harbor of G[illegible]	33 12 30	79 10 00	1	....	......	Fixed.	....	14	White.	82	85	[⊙ 4]	....	..	

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			D. M. S.	D. M. S.				M. S					Order.	In.		
267	CAPE ROMAN*	On Raccoon Key, about 6 miles from the extremity of the shoals off the cape, and 10 miles southwest of the entrance to the Santee river, S C.	33 01 00	79 24 00	1	......	Fixed.	....	14	Red & white horizo'l stripes.	65	87	......	21	11	Eighty-nine miles from the Cape Fear light-house, and about 92 mls. from the Frying-Pan shoals light-vessel.
270	CHARLESTON†	On Lighthouse Island, and on the west side of Ship Channel, into Charleston harbor, S. C.	32 41 55	79 52 29	1	......	Revol'g.	1 30	17	White.	102	125	......	21	12	This light and the beacon are used as a range for crossing the bar of the main channel.
271	Beacon	....	....	....	1	......	Fixed.	...	8	White.	...	50	......	21	1	Beacon in front of main light tower.
276	*St. Helena Bar light-vessel.*	Off the entrance to St. Helena sound, S. C.	.. ....	....	1	Bell...	Fixed.	....	10	White.	....	30	......	12	8	Fog-bell.
278	*Martin's Industry light-vessel.*	About fifteen miles east of Tybee light, Ga.	....	....	2	Bell...	2 fixed.	....	12	Red.	....	44	......	12 12	8 8	Fog-bell—light designed to guide vessels into Tybee channel, and along the coast.
279	TYBEE	On the northeast end of Tybee Island, and on the south side of the entrance to Savannah river, Ga.	32 01 21	80 50 33	1	......	Fixed.	....	16	White	92	108	......	16	15	A guide to the entrance to Savannah river, Ga.
280	Tybee Beacon	At the point of Tybee Island, Ga.	....	....	1	......	Fixed.	....	12	White.	49	62	......	14	8	With Tybee light ranging a little north of the bar.
285	Sapelo	On south end of Sapelo Island, north side of the entrance to Doboy sound, Ga.	31 21 30	81 24 00	1	......	F. V. F.	0 40	14	Red & white horizo'l stripes.	65	74	[⊙ 4]	...	..	About 46 miles from Tybee light, and designed as a guide to the entrance into Doboy Sound.
288	LITTLE CUMBERLAND ISLAND.	On the south side of the entrance to St. Andrew's sound and the Santilla river, Ga.	30 45 00	81 37 00	1	......	Fixed.	....	14	White	53	70	......	15	15	
289	AMELIA ISLAND.	On the south side of the entrance St. Mary's river and north end of Amelia Island.	30 42 00	81 36 30	1	......	Revol'g.	1 15	17	White.	50	104	......	12	14	
290	St. John's River.	Near the mouth of the St. John's river, and south side of the entrance to Jacksonville, Fla.	30 20 30	81 33 00	1	......	Fixed.	....	13	White.	65	65	......	15	12	

* A tower of brick building, to be fitted with first order revolving and Charleston light, to be changed at the same time to a fixed lens apparatus.
† Charleston light will be changed to a fixed lens light, when the new tower at Cape Roman is completed and fitted with a revolving lens apparatus.

291	St. Augustine..........	On the north end of Anastasia Island and south side of the entrance to St. Augustine, Fla.	29 52 18	81 25 00	1	....	......	F. V. F.	1 30	14	White.	52	68	[⊙ 4]	....	..	
292	CAPE CANAVERAL......	On the northeast pitch of Cape Canaveral, Fla.	28 27 00	80 33 00	1	....	......	Revol'g.	1 00	....	White.	55	65	......	21	15	There are dangerous shoals off this cape, viz: from the light-house, Hetzel shoal, northeast by north, 11⅛ nautical miles; Ohio shoal, northeast ¼ north, 11½ nautical miles; Bull shoal, northeast by east ½ east, 6½ nautical miles; extremity of shoal from cape, 6¾ nautical mls.
293	JUPITER INLET........	Between Jupiter Inlet and Gilbert's bar, Fla.	....	....	1	....	......	....	....	....	....	...	..	[⊙ 1]	....	..	Building.
294	CAPE FLORIDA.........	On south point of Key Biscayne, off the south-east point of Fla.	25 39 56	80 09 29	1	....	......	Fixed.	....	16	White.	70	75	[⊙ 2]	....	..	
295	CARYSFORT REEF......	On Carysfort Reef, near the edge of the Gulf stream.	25 13 15	80 12 44	1	....	......	Fixed.	....	18	Dark.	112	106	......	21	18	An iron-pile light-house, tower, and keeper's dwelling, painted a dark color.
296	COFFIN'S PATCHES......	....	....	....	1	....	......	....	..	....	....	....	..	[⊙ 1]	....	..	Building.
297	SAND KEY............	On a small sand and shells island, 7¼ naut. miles from Key West light-house.	24 27 09.5	81 52 43.5	1	....	......	F. V. F.	1 00	17	Dark.	121	110	[⊙ 1]	....	..	An iron-pile light-house, painted a dark color, and lantern white; it shows for a space of one minute a clear steady light; in every alternate minute there is *brilliant flash of* 10 *seconds' duration, preceded and followed by partial eclipsts of* 25 *seconds duration.*
300	DRY TORTUGAS........	On Bush Key, one of the Tortugas group, Florida.	24 36 42	82 54 00	1	....	......	Fixed.	....	14	White	65	70	......	21	18	
301	Egmont...............	On Egmont Key, entrance to Tampa bay, Florida.	....	....	1	....	......	Fixed.	....	12	White	40	45	[⊙ 4]	....	..	
303	St. Mark's.............	On the east side of the entrance to St. Mark's, Fla.	30 04 24	84 10 37	1	....	......	Fixed.	....	14	White	....	73	......	15	8	
304	Dog Island.............	On the east side of the middle entrance to St. George's sound, Fla.	29 46 30	84 40 00	1	....	......	Revol'g.	1 00	13	White.	44	48	......	21	10	
305	St. George..............	On Cape St. George, about 2½ mls. to the eastward of the west pass to St. George's sound, Fla.	29 34 00	85 02 00	1	....	......	Fixed.	....	15	White.	70	77	......	21	10	
306	St. Blas................	Near the south point of Cape St. Blas, Fla.	29 39 00	85 24 04	1	....	......	F. V. F.	1 30	13	White.	50	55	[⊙ 4]	....	..	A dangerous shoal extends five or six miles southerly from this light.
308	PENSACOLA	Near Barancas, south side of Pensacola bay, Fla.	30 19 00	87 16 54	1	....	......	Revol'g.	1 30	15	White.	34	79	......	16	10	Designed to mark the entrance to Pensacola bay.
309	SAND ISLAND..........	On a low sand island, about 3 miles south-southwest of Mobile point, Ala.	30 11 18	88 01 58	1	....	......	Fixed.	....	13	White.	52	55	......	15	14	Marks the approach to Mobile bar and entrance.
310	Beacon No. 1.....	On the south point of Sand Island, making a range with the light-house for crossing the outer bar.	....	....	1	....	......	Fixed.	....	9	White.	14	20	......	21	2	White with vertical red stripe, seaward. Bell-boat, striped buoy, beacon, and light-house in range for crossing the bar in the best water.
311	Beacon No. 2.....	On the east point of Sand Island.	....	....	1	....	......	Fixed, red.	....	9	Red.	14	20	......	21	1	Range with No. 1, clears the west bank northerly.
312	Mobile Point........ ...	On Mobile point, east side of the channel leading into Mobile bay.	30 13 46	88 00 28	1	....	......	Revol'g.	1 00	13	White.	53	58	......	21	10	

List of Primary and Secondary Sea-coast Lights and Light-vessels of the United States of the Atlantic Coast, corrected to January 1st, 1856.

Number.	Name.	Location.	Latitude north.	Longitude west.	Number of lights	and relative positions.	Fog-signal.	Fixed or revolving, &c.	Interval of revolution or flash.	Distance visible in nautical miles.	Color of tower or vessel.	Height of tower from base to centre of lantern.	Height of light above sea level.	Size of lens.	Size of reflectors.	Number of lamps.	Remarks.
			D. M. S.	*D. M. S.*					*M. S*					*Order.*	*In.*		
323	*Merril'ls Shell Bank light-veesel.*	Between Cat Island, St. Joseph's, and Grand Island, La.	....	....	1	....	Bell...	Fixed.	....	11	Black.	....	38	......	12	8	Fog-bell—iron vessel with roof over the deck.
333	Chandeleur	On the northern extremity of Chandeleur Island, to guide vessels into Cat and Ship Island anchorages.	30 03 22	88 51 49	1	....	......	Fixed.	....	....	....	...	....	[⊙ 4]	....	..	Building.
334	Pass à L'Outre..........	On north side of entrance of Pass à L'Outre, on Middle Ground Island, Mississippi river.	....	....	1	....	......	F. V. F.	....	15	Black.	69	77	[⊙ 3]	....	..	Light-house bears west ¼ north, mag.; from the large nun buoy outside of the bar.
335	NORTHEAST PASS.......	On Frank's Island, north side of the pass, mouth of the Mississippi river.	29 08 30	89 01 24	1	....	......	Fixed.	....	16	White.	70	74	......	21	15	
336	SOUTH PASS............	On the southwest side of Gordon's Island, near the entrance of the South Pass of the Mississippi river.	28 59 42	89 07 24	1	....	......	Revol'g	1 15	13	Slate.	54	59	......	21	14	Wooden tower on keeper's dwelling.
338	SOUTHWEST PASS.......	On the west side, near the entrance to the Southwest Pass of the Mississippi river.	28 58 30	89 20 00	3	1 above and 2 below it. Lower ones on each side of the tower.	......	Fixed.	....	15	White.	68	70	......	21	27	The main light is 70 feet above the level of the sea, and is seen from northeast by east around by south to northwest ½ W. The two wing lights are 23½ feet below the main light, or 46½ feet above the level of the sea; the west one is seen from south to southwest ½ west, and the east one from east southeast to south by east ½ east.
341	*Ship Shoal light-vessel..*	About 1 mile north of the west end of Ship Shoal, off Raccoon point, La.	28 50 00	91 05 00	2	....	Bell,..	2 fixed.	....	12	Black.	....	40 30	......	N'e.	2	Placed to mark Ship shoal, and guide vessels between that shoal and those making out from Raccoon point, La.
342	SHIP SHOAL............	....	....	....	1	....	......	....	....	....	....	....	....	......	....	..	Building.
343	Point de Fer............	At the entrance to Atchafalaya bay, La.	29 19 30	91 22 00	1	....	......	Fixed.	...	14	White.	65	70	[⊙ 4]	....	..	
344	*Atchafalaya Bay light-vessel.*	In Atchafalaya bay, La.........	....	....	1	....	.....	Fixed.	....	...	Black.	35	....	......	N'e.	1	For local navigation.

345	Shell Keys				1												Building.
346	Sabine Pass				1			F. V. F.						[⊙ 3]			Building.
352	MATAGORDA	On east end of Matagorda Island, entrance to Matagorda bay, Texas.	28 19 30	96 22 00	1			Revol'g	1 30	14	White, black, & red.	55	72		21	14	Cast-iron tower, painted white, black and red, in horizontal bands.
353	Aransas Pass				1			Fixed.						[⊙ 4]			Building.
355	Point Isabel	At Point Isabel, Brazos, Santiago, Texas.	26 07 00	97 16 00	1			Fixed.		16	White.	57	82		21	15	Brick tower, painted white.
356	SAN DIEGO	Near the extreme seaward point of Poinr Loma, Cal.	32 40 13	117 13 16	1			Fixed.		18	Dark.		400	[⊙ 3]			Stone dwelling, with low brick tower in the eentre.
358	POINT CONCEPTION	Near the pitch of Point Conception, Cal.	34 26 47	120 25 33	1			Revol'g	0 30	23	Brown.	35	250	[⊙ 1]			
359	Point Pinos	On the point, south side of the entrance to the harbor of Monterey, Cal.	36 38 00	121 54 22	1		Bell	Fixed.		13			50	[⊙ 3]			
360	FARRALLON	On the largest or south Farrallon islet, 30 miles south 75° 12′ W. true, from Fort or Battery point, San Francisco bay, Cal.	37 41 44	122 59 18	1		Bell	Revol'g	1 00	26	Brick.	17	360	[⊙ 1]			
361	Point Boneta	On the point, north side of the entrance to San Francisco bay, Cal.	37 49 10	122 30 50	1		Bell & gun.	Fixed.		24	White.	35	306	[⊙ 2]			Fog-gun and fog-bell. Bell struck by machinery; gun fired at half-hour intervals.
364	POINT REYES				1			Flash'g.						[⊙ 2]			Building.
365	Humboldt	On the north side of the entrance to Humboldt harbor, Cal.			1			Fixed.						[⊙ 3]			Building.
366	Humboldt Beacon.	In the rear of the main light at Humboldt, to serve as a range for crossing the bar.			1			Fixed.						[⊙ 6]			Building.
368	UMPQUA				1			Fixed.						[⊙ 3]			Building.
369	CAPE HANCOCK	On the pitch of Cape Hancock, mouth of the Columbia river, Washington Territory.			1		Bell	Fixed.		20			230	[⊙ 1]			Building. Fog-bell.

ICONOGRAPHIC CATALOGUE OF THE U. S. NAVAL LYCEUM, AT THE NAVY-YARD, BROOKLYN, N. Y.

NATURAL HISTORY.

Part II.

SECTION III.—LIFE.

THIS EARTH is made up of waters, stones, sands, metals, minerals, bitumens, and materials of every kind and shape, indiscriminately jumbled together without any apparent design. Heavy and light, hard and soft, dry and humid, solid and brittle, warm and cold, is all chaos and confusion—nothing but a heap of rubbish, it may be the ruins of a former world.

Here though, we dwell in safety. Generation after generation of plants, animals, and men pass away, and succeed each other without interruption. The productions of one class of beings are sufficient for the sustenance of another.

The seasons return in their courses—winter and summer follow like the generations of living beings; air and water only appear to be of one perpetual sameness, their currents flow on. During our own course of time all things have the appearance of order—all nature is harmonious. The earth is tranquil, animate and inanimate productions seem to contribute to each other's enjoyment, and each has its season of delights, contributing to form a harmonious and delightful habitation. Water and air only seem coeval with time.

As step by step man extends his investigations over the surface of the earth, the same unfathomable darkness of the ocean limits the extent of his knowledge t• the rind of his abode. His deepest soundings and greatest excavations for wealth, and nature's own caverns, are after all but about an eight thousandth part of the diameter of the globe. The surface of the bottom of the ocean is like the dry land, diversified by hills and valleys, plains and hollows, rocks, sands and earths of every kind. Islands are but the tops of mountains, whose bases are buried beyond the remotest contemplations of investigation. Other mountains there are, whose sharp peaks are just level with the surface of the ocean, and about their bases rapid currents divert the general movement of the waters, seeming to indicate an unfathomable mystery of conjecture. But all these have their limits, though unchangeable in their sphere.

Over one region the air is irresistibly rushing with a fury that sweeps everything before it—the ocean participates and adds its destructive convulsions; water-spouts and submarine volcanoes, with their blazing columns of torrent and fire rushing to meet the gloomy air, blackened with the angry contest, as it flashes fire and thunders destruction to the genius of man, everlastingly puts a stop to his progress. On the other hand, regions of

placid calmness, and almost motionless, yet resistless currents of air and water, drift the mariner more deceitfully but not less dangerously into a destruction, which never bears intelligence of the extent of his knowledge.

But all this chaos and confusion is inhabited by myriads of vegetables and animals, in variety infinite. The surface of the earth presents soils adapted to every production; surfaces and climates suited to every form and development. The ocean, too, is filled with life; and the air is alive with beings, all adapted to their elements.

Fig. 27. *

The adaptation of the earth to the sustenance of life, merits a more extended consideration than the collection under this division of Natural History in the Lyceum, would seem to justify. Life in its innumerable forms is so familiar, that we treat with indifference the greatest cause—the exceeding variety in its existence—why we should wonder at and admire it. Of all sciences, Natural History is the most limitless. Each new division seems to present something that should have gone before. Benevolent Nature has not only implanted in us an insatiable desire for such knowledge as constantly ennobles our best parts by cultiva- she has spread before us such an exhaustless field, that when we have comprehended a few of her laws only, our satisfaction is enlivened in the pursuit, and animation springs into being that we little dreamed of before. Surrounding scenes cease to gratify us, but in every step of progress we trace new combinations of causes from which beauty proceeds. If we recur to the past, nothing in all her works is too simple to be beautiful, and we must begin anew. If we attempt to leap the bounds, we but launch into a new field, separated, but not environed, by such causes as investigation proves to be the first necessity of our understanding.

If we pass over a beautiful and varied country, the scenery may fill our minds with the most pleasing emotions; but when we are informed that it is all owing to the most violent convulsions which have upheaved the crust of the earth, and that that is a proof of wise and benevolent design, we are either inspired with wonder or incredulity. But the geologist estimates the importance of the cause that leads to such results. He knows that if the strata which compose the exterior of the earth had never been thus upheaved, no beds nor channels would have been formed for the superficial waters, except

* ALCYONIA GIGANTIA—VASA NEPTUNIS—OR *Neptune's Drinking Cup*, is here represented in its due proportions. It is two and a half feet high, sixteen inches in diameter, and would hold about ten gallons. This very rare specimen was obtained at the depth of 60 feet in the Bay of Bengal.

hose uncertain excavations consequent on its own feeble motion, and that under such circumstances the earth never could have been adapted to its occupants. And if these eruptions had been less violent, the metals and coals which are now so near the surface, would have remained beyond the utmost researches of man. Such conclusive facts cannot fail to evince an intelligent design, and the choice of the best means, and they are instances of the provision for the welfare of what was to follow, in producing such an arrangement of causes as is best calculated to secure a state of things, most suited to sustain the permanence and happiness of animate existence.

Fig. 28. *

In explaining natural subjects and causes, the simplest incidents and experiments, assisted by the science of quantity and number as auxiliaries, in the study of the more complex principles as exhibited by various ents, are not only all that is necessary, but far more available in eliciting as well as applying the truths we would inculcate; and in proportion as we pursue nature's simplest truths, we perceive the utility and even the necessity of her arrangement in adapting means to ends, which on first glance and without due consideration, presents nothing but disorder and confusion. Apparent irregularities are converted into adaptations and conditions we have never before thought of. We find that prominent angles of one mountain constantly correspond with the concavities of another; and high chains occupying the middle of continents, islands, and promontories, dividing them by their greatest lengths. That river courses are nearly perpendicular to the waters in which they empty, and mostly following the direction of the mountains in which they take their rise. That sea-coasts are generally bordered with hard rocks, or earth and sand, accumulated by the waters themselves, or brought down and deposited by the rivers. That volcanoes never exist except in high mountains, and that some are connected together by subterranean passages, as shown by simultaneous eruptions; and that there are similar communications between certain lakes and seas. That certain seas constantly receive great quantities of water without any augmentation of their bounds, probably discharging by subterraneous passages. And that new lands can be distinguished from old, by the cataracts in the rivers, the overflowing of the waters, by the amount of vegetation or burning drought, &c. That the upper stratum of the earth is uniformly composed of, and undistinguishable from decayed organic matter, and that it is this from which all vegetables and animals derive nourishment and growth. As we penetrate deeper into the earth, sands, limestone, shells, clay, marble, granite, chalk, &c., are developed, and that these beds are always of the same thickness and parallel with each other. Strata of every kind are always divided by perpendicular

* Hippocampus, or Sea-Horse :—*syngnathus foliatus*. This is a very large specimen, and from its species, supposed to be from New-Holland. There are several in the Lyceum.

fissures, and that shells, and skeletons of fishes, and marine plants similar to those now in the ocean, are frequently found in all these terrestrial strata.

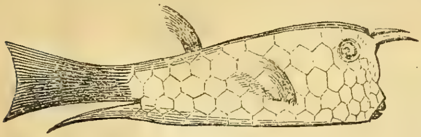
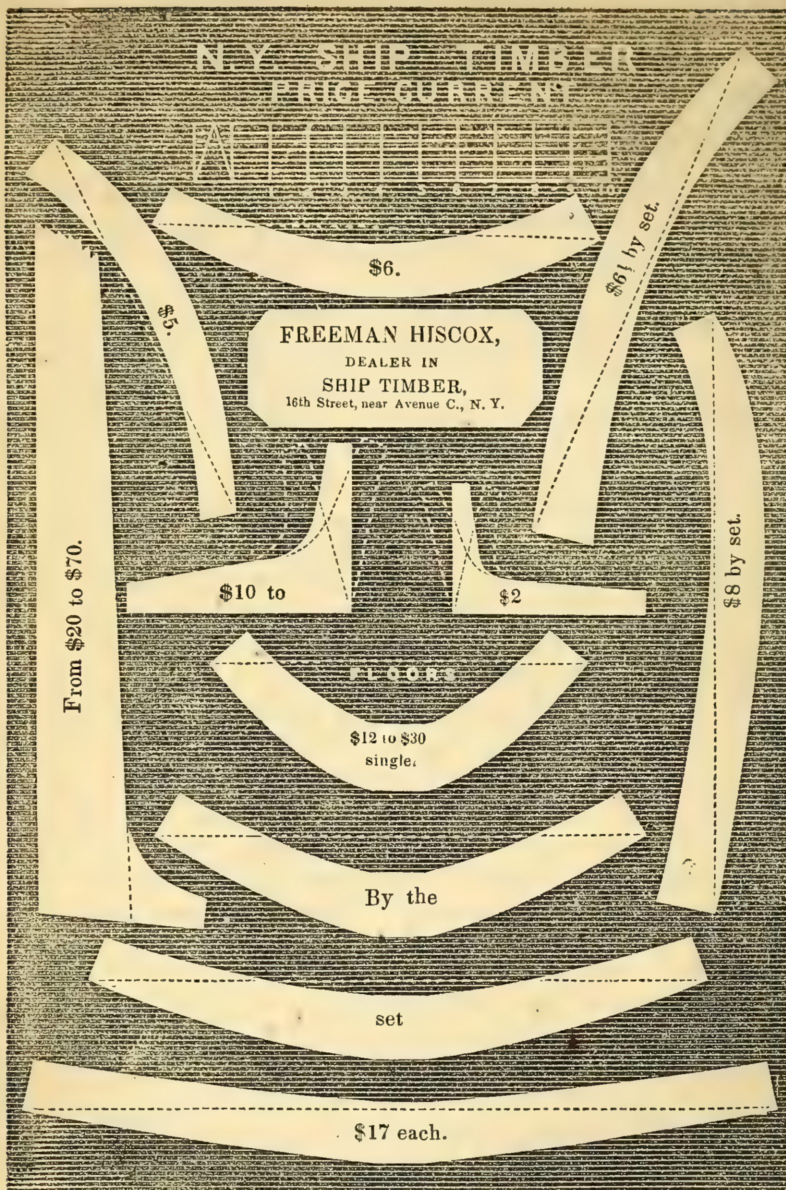


Fig. 29.*

The whole superficies of the land and water of the earth has been estimated at two hundred millions of square miles, seven tenths of which is occupied by water, and a portion of the remaining three-tenths actually beneath the level of the ocean. The Pacific Ocean itself being of greater extent than all the dry land on the surface of the globe.

The arrangement of all the different parts and portions of the earth is the consequence of the same Intelligent Power that adapts all natural agents to the support of life under the most pleasurable conditions. The earth is so constituted that it is suited to receive such influence from a combination of causes as is best calculated to maintain life, and in all its parts there is an exact proportion between agents and the substances upon which they act. The present relation between land and water has not, in all probability, always existed, and the agents which govern it, may at some future period act upon the bed of the present ocean, and entirely change the distribution of land and water. In no other way can organic remains in rocks be accounted for. It must not be supposed that the ancient shells found in rocks have been deposited upon the surface, for they form an integral portion of their beds, and are so disseminated through them that they must have been deposited together. That which was once the bed of the sea, is now dry land; and the dry land that then was, either sunk beneath the level of the ancient basins, and received their contents, or else the sea was raised and the waters filled the newly-formed valleys. Some local results may be attributed to depression, but all the great movements to which the surface of the earth has been subject, may be traced to elevation. There is no physical agent too weak to assist in altering the relations of land and water. The soft breezes which blow at evening from the ocean, the gentlest shower which falls, the heat and light of the sun, each have some influence in effecting an endless change. That time and perpetual action effect far more than casual impetuosity, is as true of matter as of mind. The occasional volcanic eruption produces terrible effects and devastation in a particular place or district, but the never ending ripple of a smooth stream, is every hour bearing to a distant sea a portion of the material over which it passes.

* OSTRACIO, *concatanatus, or Trunk Fish,* from the Torrid Zone.



A set of floors and futtocks, $9 each Oak Flitch, 30 cents per cubic foot ; oak plank, $36⅔ to $40 per M deck plank, $35 per M. ; hackmatack timber, 25 cents per cubic foot ; chestnut, ditto ; cedar, 30 to 50 cents yellow pine timber, rough, 35 to 45 cents per cubit foot ; ditto, sawed, $28 to $30 ; yellow pine plank, $27 to $30 per M.

Oak Knees—5 inch $2 50 ; 6 inches, $5 ; 7 inches, $7; 8 inches, $10 ; 9 inches, $12 ; 10 inches, $15 ; above, $1 50 perinch.

Hackmatack Knees—5 inches, $1.50 ; 6 inches, $2 50 ; 7 inches, $4 25 ; 8 inches, $6 00 ; 9 inches, $8 10 inches, $9 00 ; above, $1 per inch.

Yellow metal, 25 cents, at 6 months ; copper sheet, 28½ cents, ditto ; copper bolts, 31 cents, ditto ; composition nails, 19 cents, ditto.

THE

U. S. Nautical Magazine,

AND

NAVAL JOURNAL.

Vol. IV.] JULY, 1856. [No. 4.

IN PEACE PREPARE FOR WAR,

Has been a maxim adhered to by the monarchies of the Old World, with a tenacity and significance, which implies an aggressive purpose. Nations, like individuals, arm themselves in time of peace for a less hallowed purpose than that contained within the orbit of self-defence; and its effect is not less deleterious to a nation than to an individual; the former not being able to conceal his armament, hides his purpose; the latter conceals his weapon, until his purpose detects him, and then pleads self-defence; both are equally guilty by the laws of *equity and humanity.*

A belligerent aspect, whether in a nation or in an individual, is rather an indication of cowardice than of courage. It requires more moral courage to do right, than of animal courage to do wrong; and the consequences of the latter are much more disastrous. Armament antecedent to hostile intention is well calculated to *make cowards of the brave*, and to check the diffusion of that moral heroism which has been the admiration of the world in every age and stage of civilization. Not more unfortunate is England than other nations of Europe in "naval" and maritime "efficiency." Although positions of power and place in the administration of governments secure respect for the opinions of incumbents, *they furnish no guarantee for an adherence to the rules of science, or to lessons of practical wisdom.*

Whatever might have been the secret purpose which induced England to proclaim herself "Mistress of the Seas," when the world was at peace, certain it is, that those *bombastic eruptions* subsided without material damage beyond the consumption of her seamens rations, at the termination of the first season of operations of the war in the East. As a maritime power it was found that England's boasted supremacy existed only in name, and it required two whole years of actual war for her Admirals to study the lessons taught in

the *Baltic School of "Experience,"* from which, as on former occasions, the Admiralty learned England's naval economy to be of the most significant stamp. In time of peace prepare to *boast*—in time of war prepare to *fight.* But this vexatious question (the term of tuition) was at length disposed of. The gun-boat question, with its cost, was settled, and *England's Mosquito fleet* was completed in time to join in firing a salute in honor of the proclamation of peace. And now she has two fleets—one for *vaunting*, and the other for *fighting*, *in the next Eastern War*, *neither of which is adapted to a war in the Western World;* nor could they render efficient service if compelled to cross the Atlantic and be imperiled on the American coast, for reasons we feel ourselves competent to furnish.

It is a source of great satisfaction to our transatlantic friends, to know that they have the largest fleet in the world in time of peace. They feel much more secure in knowing that England has more cannon mounted upon her wooden walls than any other nation. She pays for this, and should enjoy all the blessings it imparts, as well as the misery and taxation it imposes. How widely different is the course and calculations of the people of the United States! They never in time of peace lose sight of the cost of an "inefficient" fleet, and in significant and unmistakable signs, they tell their English friends that it "won't pay" for a nation to keep two inefficient fleets in time of war, *much less in time of peace*, unless it be to secure territorial advantages, which neither the principles of equity, nor the powers of diplomacy were competent to obtain. The American people are not friendly to the accumulation of frowning batteries for the accommodation of blustering Admirals, which at best would have a dull sale; and of all other disposable kinds of stock, a large "Inefficient" Navy is that of which they would most desire to be free, and upon which neither sale nor mortgage could be effected. Having no sovereigns but themselves to care for; no Admirals to provide for; and but one Continent to protect, the American people have pursued the even tenor of their way toward "manifest destiny," with peace and prosperity following in their wake. And while they have the largest available fleet of merchant vessels in the world, adaptable to the purposes of war in the hour of need, in less time than would be required to blockade one-half of the American coasts, they can well afford to let England boast of her Navy, while her subjects pay for the privilege by heavy taxation. The United States, without the least desire to draw a fanciful sketch, may count upon a greater number of freighting vessels efficient for the purposes of war, than England and France together can boast, with the material resources both in armament and men for supplying as many more within a single year, if there should be employment for them. If any one would know of what service they would be in a war with England, let him consult the History of the War of 1812, or the History of American Privateers.

With a small standing army, we have a nation of soldiers; so with our Navy, just about large enough to form three or four small squadrons. The people depend upon their *Marine Militia* of merchant vessels for the adaptation of their belligerent purposes to the national demand in the hour of need. This would find employment for both the ships and the men; and those who know best how to manage them, without the probationary servitude in taking "lessons of experience." How would it be with England in a war with the United States? Would her merchant ships enter the war for aggressive purposes? Certainly not; they would be used as transports, storeships and tenders to the two fleets on their voyage of "Experience," to discover and mensurate a fleet adaptable to the *war in the Western world.* We cannot avoid the conviction, that the people of the United States have adopted the most effectual means of "preparing for war in time of peace." By not wasting their energies in *bombastic bellowings about what they could but did not do,* the American people have husbanded their boundless resources to be expended in the hour of need. But may we not learn lessons of "Experience" from the improvident waste of money and materials in the Eastern War, and build only such vessels as are adapted to the service required? American merchants need not be the least disconcerted by the noise of that *fustian bombardo,* called the British Premier. It will only be necessary to heed the monitions found on page 169 of the present volume of the *U. S. Nautical Magazine and Naval Journal,* in connection with those of the present number on the *Cotton Ship,* and in answer to a correspondent on dimensions found in the Apprentices' Department. By an adherence to these precepts by merchants and ship-builders, they may continue to build vessels, and freight them with the peaceful fruits of industry, until war has actually been declared, when, by an expenditure of the profits of their last voyage, they may be fully adapted for aggressive demonstrations, either on the Admiral's flag-ship of 130 guns, or upon the *minnows of his Mosquito fleet.* The schooners now being built of single deck, would be found to be the most profitable. If we adhere strictly to the rules of science in nautical construction, we shall not only be prepared for a war with England, should she insist upon it, but it may be made profitable, both by land and sea. The people of the United States have more to fear from themselves, than from all the powers of Europe. A war with England, however much to be deprecated on both sides of the Atlantic, on the ground of religion, humanity, civilization and waste of wealth,—would within five years not only drive England from this continent, but from the ocean, as a belligerent power. Then we say, let us abandon the rules of thumb as well as the rules of tonnage, by which our best energies have been fettered, and adhere strictly to the rules of *scientific development* in nautical construction, and it will be found that the people of the United States have PREPARED FOR WAR IN TIME OF PEACE.

A MODEL COTTON SHIP.

We are at length enabled to gratify our readers and correspondents, with a view of an *ideal* of a Cotton ship. The author of "Papers on Naval Architecture," in previous numbers of the Magazine, refers to an extensive practice in modelling and drafting as the basis of his knowledge upon the subject, and we are of those who believe that if *practice* will not perfect the expression of ideas, whether of speech or mechanism, science must come to its aid. With this illustration of nautical design, full expression will be given to the ideas of our correspondent, Phineas Pett, in relation to improving the models of a very important class of ships, viz.: those engaged in freighting cotton.

With many of our correspondent's views of the subject, we entirely coincide, and do not wish to be understood as occupying the ground, either of endorsers or disputants, exclusively, of his positions on Marine science. There is no accounting for all the opinions an architect may chance to hold at any time in regard to the philosophy of ship-building. We do not therefore, hold ourselves in readiness to correct every man's notions of science on every occasion, for it were not only a great but an ungrateful task. For these reasons we welcome the labors of every architect who endeavors to exhibit improvements in designing the bodies of ships of whatever class. In regard to modelling vessels for a particular class or service, we lay down the proposition that it is easier to produce a successful vessel for a special than for general service, we care not what may be the exigencies of that service, from the steamship of war down to the fishing-boat. Indeed, the general freighting ship, required to be successful in the hands of owners and masters of every description, is the one more difficult than any other for a builder to do himself credit in constructing.

With the accumulation of capital, and the organization of industry, which is quietly and steadily progressing as years lapse away, the general freighting ship is giving place to ships designed for special classes of business. Instead of chartering, parties having uses for vessels, prefer to build or buy, and thus supply their wants upon a legitimate basis for economy and profit. Few vessels, compared with times formerly, are now built without a particular trade in view; and to this fact no little merit is due for influencing the recent improvements in ship-building.

By reference to page 258, vol. III., No. 4, it will be seen that the author of "Papers on Naval Architecture" has defined his *ideal* for a Cotton ship as follows:—

"We want a wide ship, in proportion to depth, with a very easy bilge; with little or no rise to the floor, with as much length in proportion to the breadth, and strength, and a sufficiency of stability, and ease of working

will allow; we would give her a hollow or concave bow, in order to have a good steering ship, with the lines all rounding to the sternpost, both horizontal and diagonal. Our great length would not render it necessary to have our ends too full; still I would not recommend having the lines inside of an angle of 30° from the centre line, for a sailing ship at the load-line, as I do not think anything is to be gained thereby, especially in this class of ships. Suppose we assume the dimensions which we presume to be adapted to the form just described: length, say 210 feet at the water-line; breadth, 44 feet; depth in hold, 24 feet, and we would have a ship constructed to carry, say 118,000 cubic feet. From comparison, and our present experience, we would locate the centre of buoyancy at about $\frac{1}{30}$ of the length forward of the centre in sailing ships, at which point, or a little forward, we would fix our widest part."

Upon examination of the lines in the engraving it will appear that the design does not altogether correspond with the dimensions set down in the above extract: the dimensions of the design being, length, on the load-line, 205 feet, moulded breadth, 42 feet, and hold about 26 feet. We prefer the former dimensions to the latter. In another particular does the description differ from the design: the "centre of buoyancy" and the "widest part" was proposed to be nearer midships in the former than we find it in the latter; dead-flat is located 14½ feet forward of mid-length of load-line. The minimum angle of load-line with middle-line was set down at 30°, the angle of the same in the design is about 34°. Whatever excellencies may belong to the design, it is our belief its author had in view an improvement upon it, when he sketched the description of a Cotton ship in January last. Our impressions would appear correct from the following passage contained in a letter, dated April 28, 1856.

* * * * * "I likewise send you a tracing for a Cotton ship answering to my idea, from which two ships have already been built, [they] being 4 feet deeper—which is taken from the top-sides, the bottom remaining the same.—The ships are very successful as they are, but I do not choose to disclose their names."

We have, at this time, a single objection to urge against the design which our valued friend and correspondent has favored us with; and in bringing it forward we have no other motive than to communicate to the public, as he has done, a single principle which should govern the modelling of vessels for deep and shallow draught of water; it is this, that while the former class require an *easy bilge* in order to maintain the most advantageous altitude for the centre of buoyancy to insure stability and ease of motion when loaded; the latter description of vessel demands a fair development of bilge, in order to secure capacity, while the diminished draught, by reducing the distance between the centre of buoyancy and the centre of gravity of the vessel, (and of the cargo,) avoids the demand which is otherwise made on narrow ships of a deep draught of water. Not only so, the vessel of proportionate depth and breadth, dispensing with the unprofitable necessity for ballast to aid her

in equilibriating, absolutely requires a fair amount of bilge for stability, if she would sail upon her *bottom* when without cargo, as every ship should be capable of doing.

Did not the good sense of carriage-makers provide a sufficiency of breadth between the wheels, it would become necessary to ballast land vehicles as well as water, especially over rough country roads. Vessels depending on breadth for stability require it with no stinted measure. What nature has furnished in her principles of forces costs us nothing; she has furnished the cheapest highway in the world, and, we believe, the cheapest *stability* also.

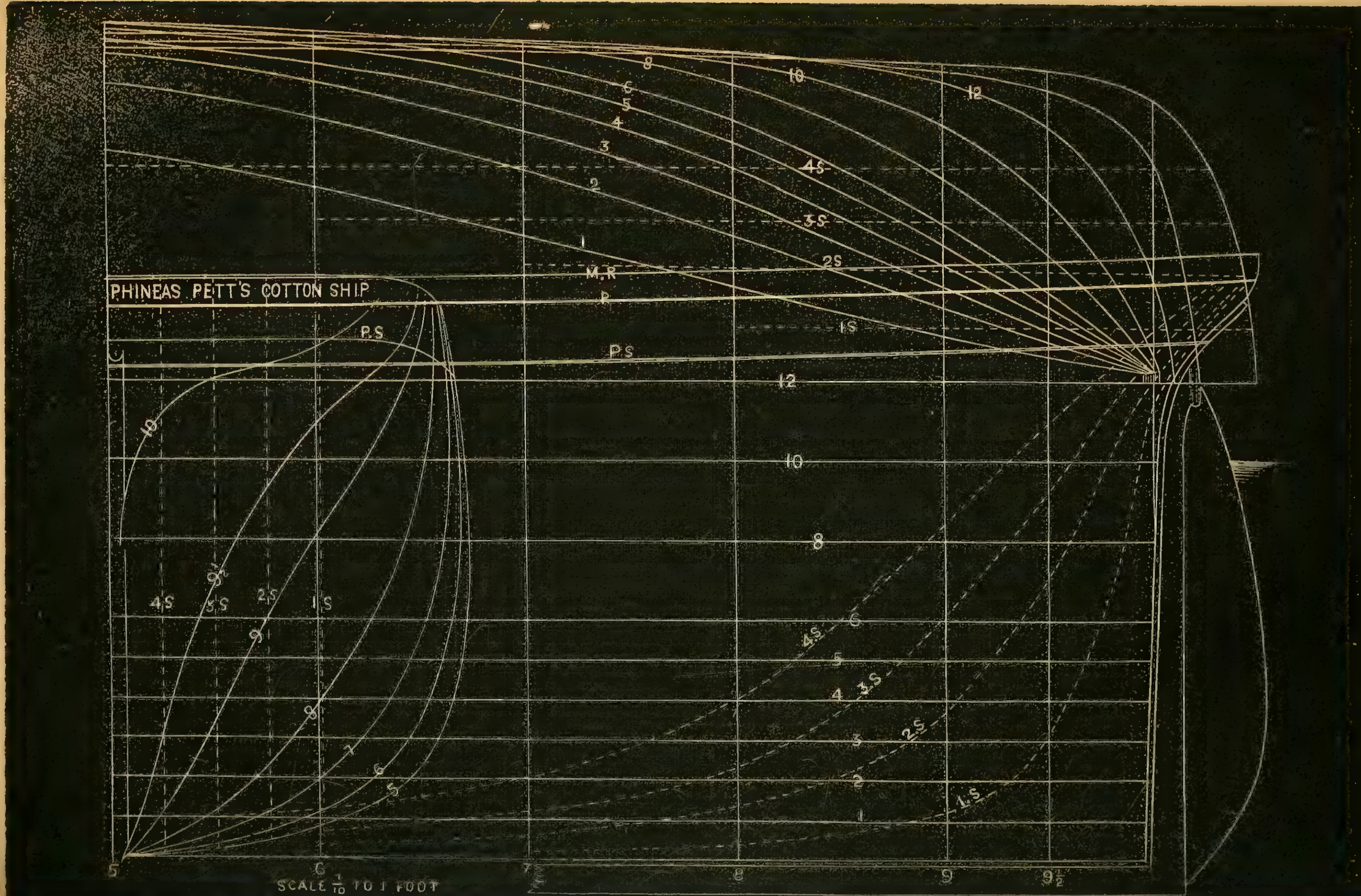
We object to a very easy bilge for a light draught vessel, because we want capacity and stability when carrying sail without cargo; because developing the bilge enlarges the lateral, while it aids to properly distribute the direct resistance, and because, when judiciously formed, it diminishes the rolling of light draught vessels.

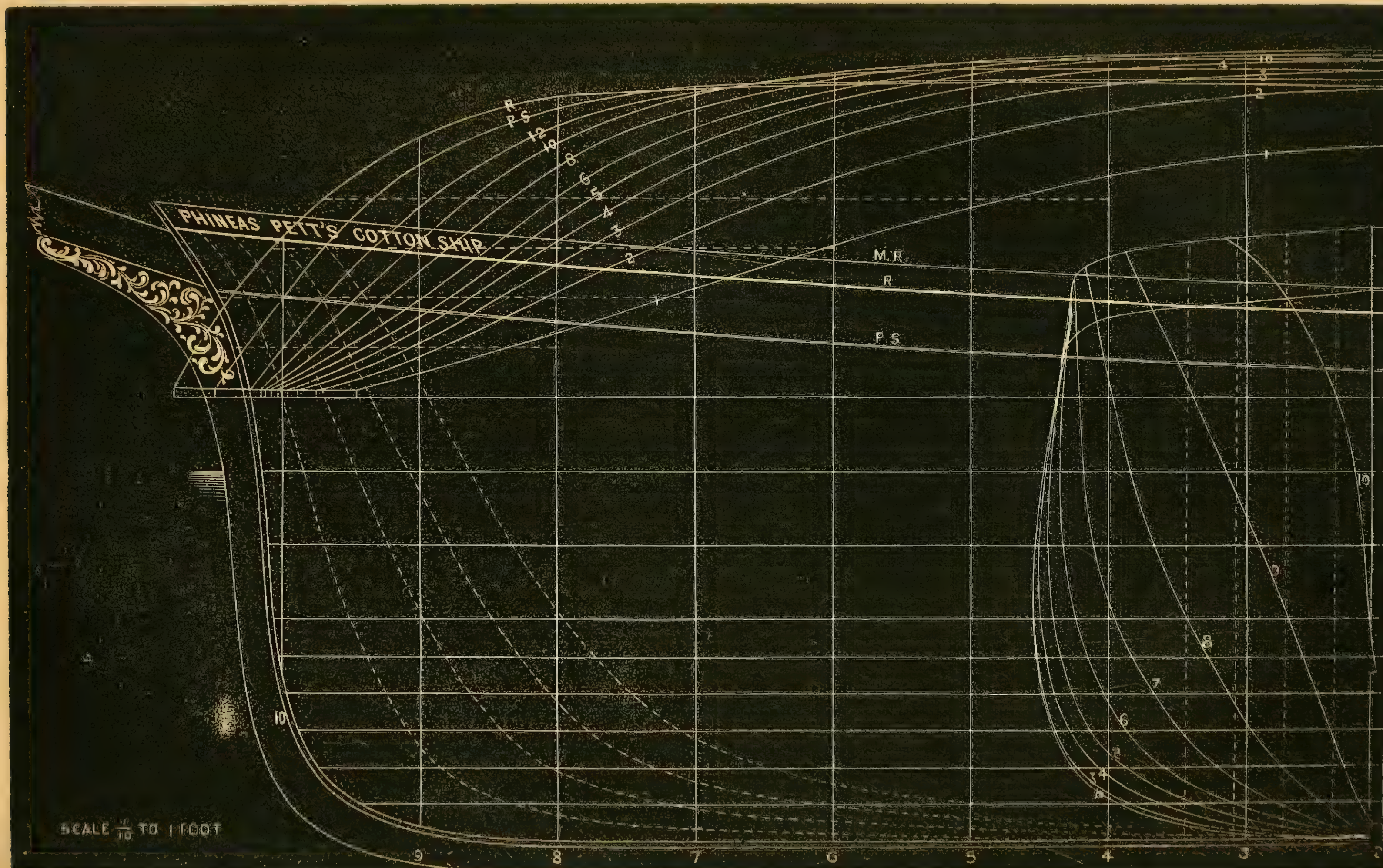
A barrel bottom is held in repudiation by good builders of shallow vessels everywhere. Steamboats are the only shallow vessels benefited by an easy bilge. As a general principle it may be laid down that in proportion as we condemn the deep and adopt the shallow vessel, in commerce, we may lessen deadrise and develop the bilge. The man who would model and proportion vessels of increased beam upon the same rules that he designs those of contracted breadth, must fail of success till his experience dictates an improvement in his models. The bottoms of our deep sea-going ships, if the topsides were removed, would, in most cases, make inferior coasters, for the reasons above.

We are aware that these remarks apply with but little force to the design of a Cotton ship before us, inasmuch as she cannot justly be pronounced as of light draught.

Without meaning to depreciate the labors of others, we may be allowed in this article to name what we would deem proportionate dimensions for a Cotton ship between New-Orleans and Liverpool. We do not expect to be called upon for the model for several years yet.

The ship would draw about 15 feet of water, with 2 feet outstanding keel, and if dimensions were arbitrarily insisted upon without reference to displacement and capacity, would be about as follows:—Length on the load-line, 234 feet; beam moulded not less than 52 feet; hold, 17 feet, with two decks; ship-rooms on the upper deck. The midship section would be full, and be located where its name imports. The breadth of load water-line section would be carried forward of midships; would care less about the sharpness of water lines than the relative ease of vertical section lines; and should overhang the bow and stern the least possible. Very few features of the present ship type of model would be found in our Cotton ship; and if old builders should pronounce her an overgrown *schooner*, it would not in the least disconcert us. We would be obliged to any one who would point out


PHINEAS PETT'S COTTON SHIP
SCALE 1/10 TO 1 FOOT


PHINEAS PETT'S COTTON SHIP
SCALE 1/16 TO 1 FOOT

to us the essential differences, if any, required between vessels adapted to freighting *lumber*, *hay*, and *cotton* cargoes, which demand space, rather than displacement, and, hence, call for breadth; as a basis for stowage, which shall not contravene the laws of gravity, and compromise the safety of navigation. Adequate strength would be derived from mechanical sources, not from disproportionate dimensions.

REGATTA OF THE NEW-YORK YACHT CLUB, JUNE 5, 1856.

THE sailing regatta, as announced in connection with the Committee's circular, in the June number of the *Magazine*, came off as announced. The day was well suited to render the occasion one of interest, the wind blowing fresh from N. E. The time of starting from the stake-boat, at Hoboken, was 11 o'clock; the following entries having been previously made and arranged in classes, in the order in which they started, the smaller or third class starting first; the yachts dropping their moorings and leaving them attached to their boats.

THIRD CLASS—*Containing Yachts carrying less than* 2,300 *square feet of canvas. Allowance of Time,* 1½ *seconds per square foot.**

Name.	Entered by	Rig.	Custom House tonnage	Square feet of canvas.	Start. M.	Start. S.
L'Esperance	C. Allen	Sloop	22.21-95	1,290-59	14	26
Hornet	H. W. Bashford	Schooner	25.25-95	1,375-05	12	19
Luckey†	C. F. Morton	Sloop	15. 2-95	1,505-18	9	04
Alpha	R. R. Morris	Sloop	23. 5-95	1,511-68	8	54
Mary	D. C. Kingland	Sloop	15.39-95	1,605-90	6	33
Island Fawn	C. T. Cromwell	Sloop	17.19-95	1,753-69	2	51
Edgar	H. A. Denison	Sloop	17. 8-95	1,819-60	1	13
Ray	F. M. Ray	Sloop	30.31-95	1,843-75	0	36
Richmond	C. H. Mallory	Sloop	27.45-95	1,845-61	0	33
Wavelet	D. T. Willetts	Sloop	31.61-95	1,863-53	0	05
Bianca	C. Macallister, Jr.	Sloop	17.48-95	1,867-98	0	00

SECOND CLASS—*Carrying* 2,300 *and upwards, but less than* 3,300 *square feet of canvas. Allowance of Time,* 1½ *seconds per square foot.*

Name.	Entered by	Rig.	Custom House tonnage	Square feet of canvas.	Start. M.	Start. S.
Starlight	T. B. Hawkins	Schooner	34.19-95	2,228-98	19	28
Mystery	J. T. Stagg	Schooner	47.33-95	2,301-74	17	57
America	R. F. Loper	Schooner	69. 5-95	2,730-11	9	02
Irene	J. D. Johnson	Sloop	57.85-95	3,078-40	1	46
Una	L. M. Rutherfurd	Sloop	70. 9-95	3,642-43	0	26
Rebecca	J. J. Van Pelt	Sloop	77. 6-95	3,163-47	0	00

FIRST CLASS—*Carrying* 3,300 *square feet of canvas and upward. Allowance of Time,* 1 *second per square foot.*

Name.	Entered by	Rig.	Custom House tonnage	Square feet of canvas.	Start. M.	Start. S.
Julia	J. M. Waterbury	Sloop	83.29-95	3,307-45	5	10
Widgeon‡	D. M. Edgar	Sloop	101. 9-95	3,502-44	2	06
Haze	M. H. Grinnell	Schooner	87.23-95	3,542-50	1	23
Gertrude	L. Spencer	Sloop	90.	3,625-30	0	00

* In the area of canvas of the schooners, the deduction of ten per cent. has been made, in conformance with the sailing regulations of the Club, which gives this allowance to schooners, when opposed to sloops.

† This boat was transversely flat-bottomed, with square bilge and centre board; with free sheets she beat all her competitors.

‡ The Widgeon, not starting at the signal, it was discovered that the iron grummet of the throat halliard block, upon the mast head, had broke, and she did not enter the race. The repairs were afterwards effected, and she sailed down the bay, meeting the squadron on its return.

The third class or smaller boats having the start, as per time list, shot far ahead, and rounded the Staten Island stake-boat in the following order of time:—

THE STATEN ISLAND STAKE-BOAT.

	H.	M.	S.		H.	M.	S.
Luckey	11	39	00	Alpha	11	41	40
Una	11	40	00	America	11	42	00
Rebecca	11	41	00	Hornet	11	44	00
Richmond	11	41	10	Julia	11	45	00
Ray	11	41	20	Haze	11	47	15
Irene	11	41	30				

There was some very fine manœuvring in rounding this boat; being close upon each other, the utmost care was requisite to avoid collision. The next stretch was across the bay to the Long Island shore, above Fort Hamilton, and passed the

LONG ISLAND STAKE-BOAT.

	H.	M.	S.		H.	M.	S.
Rebecca	11	56	45	Irene	12	..	30
Una	11	56	55	Edgar	12	..	45
Julia	11	58	45	Alpha	12	1	20
Richmond	11	58	55	Hornet	12	2	15
America	11	59	30	Haze	12	2	16
Ray	12	..	..				

The race from the Narrows to the southwest spit was unusually exciting, the Rebecca taking the lead, with the Una in close chase, and the Julia evidently gaining and shortening the gap; the smaller boats now took the stern chase. For a considerable time it was thought that the Rebecca would continue to lead the squadron to the southwest spit, but the Una overlapped and passed her at 12.42, and turned the buoy at the southwest spit first.

	H.	M.	S.		H.	M.	S.
Una	12	53	30	Haze	12	58	..
Rebecca	12	53	32	America	12	59	..
Julia	12	54	..				

The Julia passed the Rebecca, in rounding the buoy, by a stroke of good management, and at 1h. 12m. led the Una about a quarter of a mile, keeping to windward, and the Rebecca three-quarters of a mile astern.

The Haze was the favorite with the Club from her trim, neat appearance; she filled the eye to advantage; and, on the homeward stretch, proved too much for the Rebecca. The Long Island stake-boat was re-passed in the following order:

	H.	M.	S.		H.	M.	S.
Julia	1	58	..	Rebecca	2	4	3
Una	2	1	..	Irene	2	17	2
Haze	2	3	..				

and re-passed the Staten Island stake-boat

	H.	M.	S.		H.	M.	S
Julia	2	3	30	Haze	2	12	10
Una	2	10	15	Rebecca	2	13	50

The Staten Island stake-boat being on the lee shore, it was regarded as the best stroke of policy to tack and secure an offing; the Rebecca, however, did not go in stays, and, the tide being ebb, was brought to bear upon her lee bow by keeping close to the wind; as a consequence she weathered Ellis' Island, while the Julia, Una and Rebecca tacked and sailed about two miles to windward. The Julia and Una kept their relative positions, Julia taking the van; the Rebecca, by saving the tack, came in ahead of the Haze, and the race ended as follows:

HOME STAKE-BOAT.

	H.	M.	S.		H.	M.	S.
Julia	3	23	16	Gertrude	4	25	30
Una	3	29	15	Island Fawn	4	30	30
Rebecca	3	34	10	Alpha	4	42	30
Haze	3	34	45	L'Esperance	4	46	..
Irene	3	55	..	Wavelet	4	51	10
America	4	..	..	Hornet	4	52	15
Richmond	4	6	50	Mystery	5	7	50

FIRST CLASS—*Time*, 4h. 24m. 19s.

	Canvas. H.	M.	S.	Tonnage. H.	M.	S.
Julia beat Haze	0	12	9	0	14	12
" " Gertrude	1	5	41	1	6	56
Haze " Gertrude	0	53	32	0	58	34

SECOND CLASS—*Time*, 4h. 34m. 52s.

	H.	M.	S.	H.	M.	S.
Una beat Rebecca	0	8	26	0	12	00
" " America	0	23	7	0	22	27
" " Irene	0	25	36	0	20	16
Rebecca " America	0	14	41	0	10	3
" " Irene	0	17	19	0	8	16
America " Irene	0	2	29	0	00	00
Irene " America	0	00	00	0	10	47

THIRD CLASS—*Time*, 5h. 16m. 24s.

	H.	M.	S.	H.	M.	S.
Richmond beat Luckey	0	5	6	0	2	22
" " Edgar	0	11	49	0	00	29
" " Ray	0	19	26	0	15	44
" " Island Fawn	0	21	40	0	16	38
" " Alpha	0	19	37	0	21	58
Luckey " Edgar	0	6	40	0	00	00
" " Ray	0	14	20	0	20	52

	H.	M.	S.	H.	M.	S.
Luckey beat Alpha	0	14	31	0	19	36
" " Island Fawn	0	16	34	0	11	9
Edgar " Luckey	0	00	00	0	00	23
" " Ray	0	7	37	0	22	45
" " Alpha	0	7	48	0	21	19
" " Island Fawn	0	9	51	0	11	29
Ray " Alpha	0	00	11	0	00	00
" " Island Fawn	0	2	14	0	20	14
Alpha " Island Fawn	0	2	3	0	00	00
" " Ray	0	00	00	0	00	16
Isl'd Fawn " Alpha	0	00	00	0	8	30

	H.	M.	S.	H.	M.	S.
Julia beat Una	0	7	7	0	3	33
" " Rebecca	0	15	33	0	14	3
" " Richmond	0	15	32	0	16	50
" " Luckey	0	20	39	0	20	42

The struggle between the Haze and Rebecca, close by the stake-boat, was quite exciting. The latter won the turn by answering her helm quicker than her opponent.

First Class.—Julia, owned by J. M. Waterbury.

Second Class.—Una, owned by L. M. Rutherfurd.

Third Class.—Richmond, owned by C. H. Mallory.

Thus terminated the most exciting and spirited Regatta the Club has sailed in many years.

Mr. George Steers is the builder of the Julia and Una; the Richmond was built at Mystic, Conn., last summer, in twenty-six days, by C. F. Richmond, to sail in the Newport Regatta, where she took a prize.

Three prizes, consisting of suitable pieces of plate, one for each class, $250 in value, were presented to the victors on the following day.

In reference to the Richmond, it will be observed that she was the 9th yacht in starting, and the 7th at the end of the race; she is by tonnage one-third of the size of the Julia, less than one-third of the size of the Haze, and but little more than one-third of the tonnage of the Una and Rebecca; and when it was remembered that her start was but 33 seconds, it cannot be doubted but that she possesses a well adapted shape for speed as her performance has shown; and we would call the attention of our readers to the leading article in the June number on the most profitable size and shape for vessels. In connection with this first remark, and the following queries, the Richmond has great beam and great stability; she is not what in common parlance would be called long.

Sailing regattas are coeval with the advancement of nautical science; but what has science gained by them, and why has not the commercial world been benefited? They are designed to be the index of refined nautical genius, conducive to the pleasure and advantages of progressive art, and may always be freighted with lessons of profit to the maritime world. Have they been? Echo answers No.

Philosophy in nautical construction, like a ray of sunshine, sheds its mellowing beams on every department of nautical science, until it *shall* melt in the crucible of truth every vestige of prejudice, every relic of a barbarous age. This regatta has been an exciting one, and the committee deserve credit for their untiring zeal and energy in making it such. Doubtless the classification and rules of allowance were the best which have ever been adopted in the United States; but they come far short of what they may and should be, if yacht sailing is to be an advantage to science, and a test for the best shape for speed. The Julia won the prize, it is true, because she was the first boat

at the home stake; but does it prove that she is the best shape for speed, size and area of propulsion considered? By no means. What has tonnage to do with the size of a vessel? Nothing at all. The classification, as set forth in our last issue, covers a latitude of 1000 yards of canvas, and at the same time one square foot is regarded as equivalent to one second of time. Was it ever known that this was the precise proportion of any vessel? We answer, no. Why, then, should we guess at a matter of so much importance? The only rule for yacht sailing that should be regarded worthy of a name is, first to determine the displacement of the several classes, how great it should be. Then we should have equal displacement, equal areas of load line, equal area of sail. This leaves the question of dimensions and shape free, as it should be, which tonnage does not do. Under such rule the best shapes would win the race in each class. It may be said that this cannot be done on account of the difference in the sizes of the yachts; then we say, take the displacement and area of load line of every yacht which has sailed in a race, then see what proportion the sail bears to the displacement, also to the area of line of flotation; make a rule accordingly from the mean, and bring all to it. But there is a great equality in reference to the wind. How often it occurs when the wind is very light, the boat perhaps astern of all the others, may catch a favorable *cat's paw* (extending only a few yards in width) and carrying it with her, outstrip all the rest. In order to obviate this, there should be an instrument on board of every yacht, placed at the altitude of the centre of propulsion, which would determine the pressure of wind used per square foot of sail—then the contest would be equal. The boat having the most wind would be expected to sail the fastest, and there should be no starting time allowed in the same class. The problem would be the best shape for speed of a given size—equal displacement, area of line of flotation, area of sail, and pressure of wind upon the sail indicated by an airometer, set at zero by the committee before starting, and indicating and recording the pressure of wind during the race. Science would be developed in a regatta governed by such rules, and the world would be benefited by such a course. They would be the most interesting exhibitions ever introduced in this country. Which will be the first club to adopt this course? We hope the New-York Club will not be the last to adopt this, or a similar equitable rule. It is indeed time that *all rules of thumb* should be abandoned, and that the principles of science be at once inducted into regattas for pleasure, as well as voyages for profit.

INEFFICIENCY OF THE NAVY.

It may seem to those not familiar with the disordered condition of the Navy, in the *material* as well as in the *personnel*, that enough had been said and written on "inefficiency" for the present, at least. We shall be glad when, in conformity with the Secretary of the Navy, and Congress, the will of the people shall have been so far respected, as to enable us to place the Bureau of Construction on the *efficient list.* The patriotic hush of silence even now bids us be quiet, and we should yield to the promptings, did we not know that to save the right arm of national defence from amputation, the pressure of the press must be applied, until the generative cause is removed. There can be no such thing as resolve for the future, until there is remorse for the past. Mankind never improve upon the past, until they discover its errors. Just criticism is a positive benefit to the maritime and commercial interests of the United States, and will not be regarded as less beneficial to the Navy, by the people to whom it belongs; and lest any one should regard us as being unfriendly to the Navy, because they are unaccustomed to finding an *expose* of its condition beyond the margin of a daily sheet, we will farther assure them of their mistake, and define our position in lines still more legibly drawn, not only for their benefit, but also for that of the Bureau of Construction, etc.

Having some knowledge of Naval as well as of Marine construction, and with a pen in one hand to draw lines in accordance with the rules of right, as we understand them, and an axe in the other to cut by those lines; we shall not be lax in our efforts to make an incision into every protuberance of unhealthy growth, in any branch of the Naval service. We are glad of the friendship of those who command, as well as of those who construct our vessels of war, some of whom are our personal friends. We have met our Naval Constructors in the model room, and the present Chief of the Bureau of Construction of the number, exhibited models and drawings, and furnished them with the benefit of our experience; and if they have not been profited, it must be because of their antiquated proclivities. We shall not surely be regarded as unfriendly to the Navy, because we expose its wretched condition. Our magazine is open to the naval, as well as to the maritime and commercial interests, for the correction of errors when they are shown to be such. We are friends to the Navy, and have strong attachments to it, engendered by long service in its material department, and shall do all that we can to promote its interests, and render it efficient; first, by removing the obstructions to its progress, in showing what it is; and then by showing what it should be. We say to all connected with naval affairs: gentlemen, we shall beglad of your friendship—*be friends if you will, but enemies if you prefer. Our motto is Excelsior.* Those who adopt our motto will be with us; those opposed, against us. We may not be able to correct all,

or indeed any of its errors, but the people can, and will, when Congress shall have been made acquainted with its condition. We can mark the shoals, and give their bearings and soundings, and perhaps, place beacons or buoys upon them; this will be doing something toward *efficiency*. Had the magazine been launched earlier upon the tide of public favor, possibly we might have saved the hull of the "Merrimac," and perhaps her boilers and propeller from "inefficiency," when the Bureau of Construction would have been as glad to have witnessed an exhibition of her log, as it is now to have it concealed. Is the Merrimac a failure? Who that is competent to judge will assume the responsibility of denying it. If any, let them come forward, and we will demonstrate it. *We have four others of similar stamp, in the first edition of war-steamers, built under the late act of Congress, at the recommendation of the Hon. Secretary.* Is it a time to talk of efficiency in the Navy, when war steamers by the squadron are rendered "inefficient" by deformities in shape, launching, power, and equipment? Is it a time for gratulations, when the efforts of the Secretary of the Navy, and the appropriations of Congress, are squandered in building vessels, whose draught of water shut them out of *nine-tenths of the harbors of the nation's entire sea-coast*, and that the most extensive of any on the globe? We had certainly assumed that, however great the amount of "inefficiency" in the steamers referred to, the "satisfactory" trial trip would be completed before either of the vessels would be placed on the sick list for repairs. But the reader may judge of our surprise to learn (while writing her name,) that the Merrimac was being towed into Key West, after a tedious passage from Havana. Lest this "satisfactory" trip should be spoiled, we drop the curtain for the present on our war steamers, more especially the "Merrimac," to show what the country had a right to expect from the act of Congress of 1842.

It was the pressure of the public opinion through the press, that induced the act referred to, when the Navy Board of Commissioners were removed, and the Bureau system established. Not only was the Board of Commissioners composed of post-captains, (but for a very considerable time, if not for years, after the passage of the act of Congress requiring the Chief of the Bureau to be a *skilful Naval Constructor*, was a post captain at *its* head,) none of whom knew more of the philosophy of navigable shape in vessels than a *Japanese*. The Board of Commissioners were not content with seizing within their palsying grasp whatever Congress saw fit to appropriate for the Navy's sustenance and increase, and stamp it with the imprint of decrepitude and imbecility; but they silenced the Naval Constructors by the free use of the power they possessed. Before their removal, they succeeded in spoiling millions of dollars worth of materials, by making whole forests of live oak to conform to the most heterogeneous models; filling the timber sheds already built, and building more in all the Navy Yards; thus to fetter the genius of generations yet unborn, by confining the shape and size of

vessels to those unsightly frames already cut. And now we find the Chief of the Bureau, in his report to Congress, endorsing these models or the frames they represent, and with the full knowledge that they are not the kind of vessels required for the Navy, he dare not take the responsibility of condemning them, lest peradventure such a course might be the means of condemning him for the position he occupies. Who does he fear? Can it be the *personnel* of the Navy? Perhaps it is the *United States Nautical Magazine and Naval Journal.* Who can tell? Did the announcement that the Hon. Secretary would hold him responsible for the performance of the five steamers frighten him? Timid Chief. Has he received a copy of the official report from Key West? Was it "satisfactory?" Read the papers.

THE GRAVING DOCKS OF PORT JACKSON, AUSTRALIA.

THE Sydney papers announce the completion of two very capacious dry or graving docks, and the construction of a patent slip within the past year, thus affording to the chief port of the South Pacific extensive means of repair and refit for sailing and steamships navigating that part of the globe. These facilities are regarded by the maritime interests, not only of Sydney, but of every other port in that and neighboring seas, as the most important and valuable achievements which either public or private enterprise has yet effected in Australia. The port of Sydney now possesses unrivalled facilities for the repair of shipping, and is likely to become the chief great docking port in the Southern hemisphere.

DIMENSIONS.

	South Inlet Government Dock, Portsmouth. ft.	in.	Fitz Roy Government Dock, Sydney. ft.	in.
Extreme length	335	0	336	0.
Length of the floor	303	0	300	0.
Extreme Breadth	80	9	79	0.
Extreme Depth	29	0	27	0.
Depth of water at Spring tides	23	0	21	9.
Width at entrance,	70	0	60	0.

The basins of these docks have been excavated out of compact sandstone and hard slate. The floors are formed of massive blocks of stone, each 3 to 6 tons in weight; and are so cut as to form an inverted arch of 72 feet radius. The step-stones along the sides of the docks are of the same massive description—each one forming two steps of a foot-tread. The piers between which the caisson rests, have two sills 20 feet apart, to which are bolted, with 1½ inch copper bolts, the timbers 12 by 12, to form a surface against which the caisson presses when the water is pumped out of the dock; the pressure caused by the water outside being calculated to be equal to about 400 tons distributed over the surface.

The South Inlet Dock was ten years under construction, at a cost of £120,000. The Fitz Roy will have taken about eight years, when entirely finished, and cost the colony £100,000.

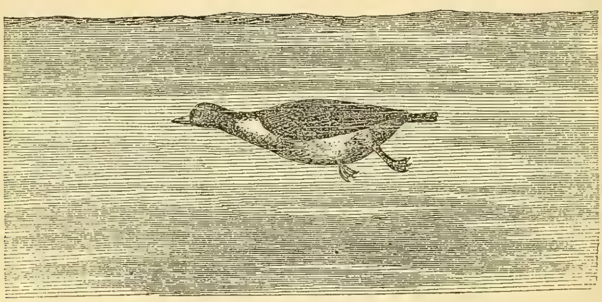
ON BALANCING THE FORE AND AFTER BODIES OF SHIPS.

We had deemed it a well nigh established principle in merchant shipbuilding, in this country, that the greatest amount of resistance in sailing was encountered on the foremost end of the vessel, and consequently the sharpest end would open the displacement with greater ease that the bluntest—the power being the same in both cases. We did not expect to be called upon to wake up some *Rip Van Winkle* to the light of this late day, upon the propriety of propelling vessels with the sharpest end foremost when we have high speed in view, especially any one in the least degree divested of prejudice in favor of the past, and equally familiar with the history of experimental shipping in this country. Yet, the favors of some of our correspondents clearly point out the necessity of a few remarks in answer to their manifest desires on this subject. Argument is quite superfluous on a question where every man's observation, if he has had opportunity, should be competent to decide. Nevertheless there are a few who are not yet convinced of the truth of the above principle, and who insist upon the proofs—these we have no hopes will ever convince them, for their practice upon the opposite idea has been too extensive, when compared with all the world beside, to be weighed down in the scale. When we state a fact—not an opinion—but a fact as capable of proof as any other known in the shipbuilding experience, we are challenged to the proofs. Very well. First, we prefer to sail the sharpest end foremost, because the vessel, if properly shaped otherwise, and skilfully propelled, performs the best. This has been proved in steamboats, steamships, propellers, yachts, pilot-boats, and in clipper-ships, and indeed in every class of vessel. We think it can scarcely be necessary to put our fingers upon the vessels, which are really too numerous to mention, that have become famous for their performances in consequence of being sailed with the best, finest end foremost. On the other hand, we have to acknowledge that many fine performances have been, and will no doubt continue to be, made with vessels modelled upon a different principle. The truth is, the bow is the acting, contending end of the fabric; it displaces the fluid for the entering vessel by elevating and spreading abroad the molecules of fluid, which have only to obey the force of gravity, in order to fill the vacuity of the passing vessel at the stern. The duty of shape forward is to open the fluid with ease and skill, and the duty aft is to admit the equilibriation of the fluid with grace, and not with abruptness—no sharpness being required beyond that necessary to avoid towing a wave stern; and to our mind it appears an equally losing operation, *either to push or pull a wave across the ocean.*

We know that lines which will not pull a wave after the stern, will push one ahead at the same speed—hence reason infers that there is more resist-

ance encountered on the bow than stern. Experiments of every description will prove the proposition.

Reference has sometimes been made to the form of the anterior plane of flotation of the duck as he swims on the water, in comparison with his posterior extremity, in illustration of nature's predilections in this matter. Very well; we will take the case on the objector's terms, and remark, that when the duck is wounded, or otherwise incapable of using his superior motive machinery, he is accustomed to dive, and beneath the surface, without exciting a ripple or a wave, to paddle away from his pursuers at an astonishing rapid rate. With the very same displacement, in the one case as in the other, his speed when entirely immersed is more than double, to all apperances, than when swimming on the surface. Now, it is patent to our observation, that under such circumstances, the web-footed navigator stretches out his anterior portion, as when flying, forming an amazingly long, hollow water-line section, with the dead flat section located a long way abaft of midships, with a short run aft, and the propellers applied under the counter. So much for the duck argument: that drawn from fishes would afford but little more satisfaction to the advocates of long after-bodies.



Sketch of the Duck under the Surface of the Water.

But there are supposed to exist objections of a graver character against forming the bow sharper than the stern. It is declared by some to ruin every good quality of a vessel, in other words, to constitute her a *failure.*

We will quote from a correspondent—his remarks upon a certain ship—perhaps the sharpest sailing ship ever built in this country. "I really think the ship to be the greatest *failure* of the present time, both in *model* and *construction.* I say this, because I view a ship as a scale-beam, which, if unbalanced in form or weight, or not being equally supported at both ends, one end must have a greater tendency to fall than the other, which must stop the progress of the moving body. Now the ——— was 3 feet by the head at launching, consequently had to have a large amount of ballast stationary in the after end; and as the greatest strain in a ship is lengthwise, a constant tendency of the ship is, to break in two amid-ships—her

construction not being strong enough for this constant strain, broke the ship down, and it became necessary to sustain the forward end of the ship, or lengthen out the after end—and no alteration in spars could have effected these requisites." We would inquire in all candor if the writer meant what he has said, that lengthening out the after end would be equivalent to sustaining the forward end, and if so, why not obtain the necessary weight from pig-iron in the run, just as well as to get it from dead wood and fastenings, by extending the ship to a sharper termination aft? To "sustain the forward end, by lengthening out the after end!" what folly to apply such a criticism, the secret of the whole matter being prejudice against a long fore body. What thinking man *could* propose such a balancing of the scale-beam, already "broken," according to the premises laid down? Filling up the fore body does look feasible at first glance to the unexpert. But if there are no better reasons for adhering to a balance of ends, than those on the principle of the scale-beam—weight for weight—in making the models of vessels, we would as soon have the weight in one way as another, what difference so long as the trim is gained? Remember that the added part is to gain no buoyancy, which if it did, would make the matter worse; we cannot discover any truly mechanical foresight in such a method of balancing fore and after bodies.

The "construction" was at fault, the writer states—the ship had not sufficient strength. If, as he states, she broke down, it was for no other reason than for the want of strength. One such reason is sufficient to indicate the true remedy to a mechanical mind—strengthen her;—why patch up the model with sustaining power from the fluid? Put in an iron keelson of any required size or strength necessary to sustain the bow, but don't condemn the model for faults of workmanship and lax methods of construction. This is, to use a vulgar phrase, an old *fogyism*, to charge the strength of the ship upon the maker of the model; let every responsibility be placed where it belongs. Has it come to this that farther improvement in modelling must be checked, forsooth, because ship-builders have no means of sustaining the ends of vessels, except what support can be derived from the variable element of the waves?

Engineers of another profession can span Niagara's gorge, the St. Lawrence and the Mississippi, yet ship-builders must balance one end of the ship by the weight of the other, that there shall be two ends to "sustain" instead of one, and that both shall go down together, when the structure is endowed with deficient strength! With regard to the vessel being equally supported at both ends, we deem it improper for a first class ship to be supported at all by the fluid at the ends. This cannot be done, and produce a vessel of seaworthy account. The intrinsic strength of the fabric must support the ends. A ship in motion develops forces which may not be suspected from a contemplation of her seat in the fluid at anchor. If properly shaped below

water, forward, she experiences a large lifting force to counteract, and regulate her propulsory leverage and oscillatory motions, while the stern, if not properly formed—filled out—feels a settling tendency into the fluid. The violence of pitching depends more upon the malposition of sail than unbalanced ends, in most cases that have come under our notice.

But the desire for "argument," as our writer avers, leads him to propose an extreme case for our solution, as follows: "Now, suppose we for the sake of argument, carry your theory to the extreme, and make the ship all bow, and the midship frame at the stern-post—how would it be possible to navigate such a body safely?—we must have an after end, and it must be properly proportioned to the fore end, and the nearer those ends are alike in displacement, the weights aloft remaining the same at each end, which they never are—the easier must be the lengthway motions of the body—although it is not requisite to have the ends shaped the same." Now suppose we, too, for the same grave reason, propose the opposite ridiculous extreme, and insist on propelling the one-ended body with the stern-post and *midship* frame forward, in illustration of the writer's theory? What then? Is he prepared to say that his theory would work the best if put to such an unfair test? We doubt it. We leave him to show how his theory would "navigate" under such a development as *we* have supposed; while we answer his interrogatory, that it would *not* be possible to "navigate such a body safely" with the *stern* foremost; we prefer the chances with the sharp end to the wave.

Novel Applications of the Principle of a Free Axis of Rotation on Shipboard.—The Astronomer Royal for Scotland has invented an instrument to facilitate the taking of astronomical observations at sea uninfluenced by the motions of a ship. By employing a *balanced* frame and one or more axis of free rotation, the author has contrived to keep small tables perfectly uninfluenced by the angular motions of the ships, the tables being designed to carry the astronomical instruments; he also designs completing other apparatus large enough to carry the observer, and proposes to produce the necessary speed of rotation by water or steam, acting upon a new form of driver, and which requires no wheelwork. In New-England, very recently, an ingenious mechanic has made application of the same principle of a free axis of rotation to relieve ocean voyagers from the unpleasant motions of the ship, by a seat or bed mounted on the axis as described, where they may defy the energies of wave and tempest. One or more of our ocean steamers have had their berths so arranged.

TWO STEAMBOAT DISASTERS AT A TIME.

BURNING OF THE STEAMBOAT CITY OF NEWARK.

The steamboat City of Newark, plying between this city and Newark, took fire June 10th, on her morning trip to this city, at about a quarter to 9 o'clock, when off Staten Island, just before entering the bay. The fire took place in the fire room from the boilers, and the boat was actually on fire, while the captain was giving a lady passenger assurances that in case of fire there would be no danger, the boat being well supplied with all the appliances for extinguishment. The sequel proved that no attempt was made to use them if they were on board, as the boat burned to a shell, and three passengers were drowned by their eager haste to leave the burning wreck, by a lady passenger jumping on the gunwale of a boat already full. Fortunately the fire was discovered by the Achilles, the Commodore, and the Thomas Hunt, all of whom promptly came to her assistance, and with their small boats took off all the passengers, the steamboats themselves not daring to approach near enough to take them, lest they should take fire. The Achilles came up to the bow, the flames driving aft toward the stern. But for the prompt and efficient aid afforded by these three steamboats, few of the sixty passengers would have been saved from the flames or a watery grave, and as it was, quite a number were scorched by the falling cinders and the intensity of heat. The wreck was towed upon Jersey flats by the Commodore. How long will the Insurance Companies of this city take Ferry or Steamboat risks on such boats as have their boilers encased with wooden bulkheads—wooden boxes to hold fire? The City of Newark had an iron tank on board to hold fresh water for the boilers. What a glaring inconsistency—iron tanks to hold water, and wooden tanks to hold fire!

ANOTHER.

On the same day an explosion took place of the boilers of the Ferry-boat running in connection with the Grand Trunk Railroad, Montreal. The explosion occurred about one o'clock in the afternoon—the two boilers, although disconnected, were thrown clear of the boat, making her a complete wreck. Twenty-seven persons were killed by this reckless carelessness. How long before the engineers of the United States will furnish a steam-boiler, that will be safe beyond the possibility of explosion unless by design, economize coal, and make the necessary amount of steam, without occupying so large a portion of the vessel's capacity? Their number is very great, and but few agree upon the best mode of filling this great want. Engineers have given more attention to the engine than to the boilers, seemingly forgetting that the steam is the power, and that the boiler was quite as important, if not indeed more important, than the engine itself

From Chambers' Journal.

THE DIGNITY OF LABOR QUESTION.

We hear much from time to time on the dignity of labor. It has long been a favorite theme with more than one class of writers, popular, or seeking to be popular; and it is a capital stock-subject for the perambulating lecturer's platform, and a good card to play when you want to trump your adversary's suit in the game which comes off on the hustings at electioneering times. On such occasions it is that we are reminded how 'labor stands on golden feet'—how the working man is the real, gigantic, creative force, which practically does everything that is done at all—how it is he that transforms the wilderness into a garden—that takes the savage from his holes and dens, changes him into a philosopher and statesman, and sets him in palaces, &c. If there ever was any argument in this sort of rhetoric, which appears to me rather doubtful, the argument has by this time lost its force through sheer iteration, and makes no more impression upon the mind than does the everlasting dashing of the mill-stream upon the organs of the miller. If I, who have been a working man or boy for nearly thirty years of my life, may be allowed to express an opinion, it would be to the effect that this grandiloquent and indirect way of designating him with flattering titles is not the sort of thing to be of much service to the laborer. I don't think that unearned or half-earned laudations lead to endeavor or to the growth of self-respect, and I have observed that wherever these two things are wanting, though labor may stand on golden feet, it is often in want of a decent pair of shoes and stockings to keep them from the mire. How to raise the laborer to the level of his calling—to make him as respectable as is the work of his hands—to lift him from the slough of ignorance, intemperance, and willing dependence—this is a problem I should like to assist in solving.

I lay pondering this question the other night long after the echoes of the last footfall had died out in the street below; next morning, it still lingered in my thoughts; and when I sat down to the desk in my three-pair back, after breakfast, and began mending my pen, it remained uppermost. So I resolved to devote my scraps of time to saying something about it; and, looking out of the window, over the roofs and among the chimney-stacks, for an idea to start with, my eyes lighted on a spectacle, than which I could have desired nothing more suitable for a text.

My window, which is elevated some thirty feet, overlooks, at a distance of about twenty yards, the flat roofs of a row of two-story houses, perhaps a dozen in number. The roofs are all on one level, and covered with lead, with a low wall or battlement on either side. The leaden roof got out of repair; and a party of plumbers, four in number, had emerged from a trap-door in the central house, and, armed with a brasier, a melting-pot, a few lumps of lead, a few planks, and sundry soldering-irons, &c., addressed themselves to the performance of the necessary reparations. But how did they set about it? I shall record their proceedings *seriatim*, conceiving that they have something to do with the dignity-of-labor doctrine, and may throw some useful light upon it. First, the brasier was fixed upon the planks, the melting-pot mounted in its place, and a fire lighted under it—a couple of the irons being placed to heat in the fire. While the lead is melting, two of the men walk up and down the roofs, apparently in search of the defective

spots to be repaired; and these they mark with chalk. A third turns the cover of the trap-door over, and chalks upon its inside a large square, divided by cross-lines into nine smaller squares. This he places in a convenient spot, against a central stack of chimneys, chalking off a line distant from the board exactly seven paces. The fourth man now produces from his pocket a small bag containing nine drops or dumps of lead of a few ounces each; and the whole four, having tossed up for partners, commenced playing the game of pitch, each throwing the dumps in turn, and scoring what numbers he made on his own side of the chimney. The squares appeared to bear the same numbers as the cups on a bagatelle-board, the centre square counting double. For two hours the game goes on, the only work done being an occasional replenishing of the fire. At eleven o'clock, the balance of the game is struck, and one man goes off with the winnings to purchase beer. During his absence, some small ladles are dipped into the melted metal, and on various parts of the roof, and by the aid of these and the application of the hot iron, a number of shining demonstrations are soon visible. But the messenger is back in a quarter of an hour, bringing a gallon can with him; and the party spend the next three-quarters in discussing its contents, comfortably seated on the sill of the trap-door. At noon they resume work, and continue it in a leisurely way for nearly an hour, when it is time to go to dinner, and they disappear.

In the afternoon, so soon as the fire is replenished, the nine-square game is resumed, and continued until close upon four o'clock, when suddenly the game-board is turned with its face downwards, three of the men scamper off, each with a ladlefull of lead, and the fourth is busy feeding the fire and replenishing the metal-pot. The cause of this sudden fit of industry is soon apparent, for the fireman has hardly pocketed the dumps, when the foreman emerges from the trap-door, and begins a survey of what has been done. He appears to have no suspicion, and retires after giving a few directions. In ten minutes after his departure, all further pretence of work is abandoned for the day—something less than two hours having been passed in labor.

For three days more, this farce continued, and then the job was supposed to be finished. That everything done might have been done in a single day, and that with ease, I do not hesitate to declare; but this perhaps the dignity of labor would not allow.

Were this exploit of the gambling plumbers a solitary instance in my experience, of the way in which working-men sometimes plunder the paymaster, or defeat his purposes, I would not have set it down here as an evidence against them; but I have in my time seen so much of the working of the same spirit—I have seen such direful mischiefs resulting from it, as well to working-men themselves as to their employers—and I am so well aware of its prevalence at the present moment, and the danger attending it, that I do not feel justified in refraining from any exposure which may draw down upon it the rebuke it merits. Not long ago, a case came to my knowledge in which the foulest wrong and injury were inflicted upon a generous and benevolent man, because he could not be induced to submit to extortion. The case was this: wishing to add a sheet of ornamental water to the garden-grounds of his country-seat, situated on the skirts of a village, he had half an acre of his land dug out to form the pond, and a brick culvert constructed, from a rivulet nearly a mile off, to feed it. The culvert ran under a neighbor's grounds, and beneath his own lawn. He employed

the laborers of the village and neighboring district to do the whole work, and paid them liberally; but he would not allow them to drink as they chose at his expense; and in revenge, while taking his money, they contrived and carried out a plan for ruining his undertaking, and flooding him out of his house. It succeeded so well, that it drove him from the place forever. He sold his land and residence, and transferred his enterprise to another county. He lost a heavy sum by their treachery, and they lost the advantage of his capital and enterprising spirit, which would in all likelihood have provided employment for them and their children for many years.

A builder of my acquaintance contracted to execute a certain piece of work within a given time. There was no difficulty about it, and not the slightest necessity for hurry. He placed the usual complement of hands upon it, and kept them at work the usual hours. The work proceeded prosperously, and was advancing towards completion, when the men by accident arrived at the knowledge that the employer was bound in a considerable sum to get everything done by a specified time. They immediately relaxed in their exertions, and evinced a determination to defeat his object; he threatened legal punishment, but they knew he was at their mercy, and still dawdled on. It was, at last, only by a bribe of a supper and drink that they could be roused to sufficient energy to make up for lost time, and save him from the ruinous penalty.

Lately, when the newspapers were relieved from the burden of the stamp-duty, a sufficient amount of capital was subscribed by a company of shareholders for starting, with fair prospects of success, a new journal in a provincial town. With the view of getting it out in a workmanlike way, a staff of men were sent down from London, having been engaged at the customary scale of wages. Finding, when they got there, that the managers of the affair were not practical printers, they contrived to double their charges by additions for overtime, and for many weeks received nearly double wages. This could not go on long without investigation by a qualified printer. The scrutiny that followed revealed the curious fact, that sufficient sums had been paid for overtime to cover the whole of the work done, and that virtually nothing had been done save in over-hours—so that, if the accounts were to be credited, the whole staff must have slept but once a week! As a matter of course, the extortion was put an end to—when the same staff did the whole work for the usual wages, though I have not heard that a word has been said by them about refunding.

An editorial friend wrote to me the other day, that having had a difference with his compositors, he had met them candidly, argued the question deliberately, and shown them, to their apparent conviction, that they were wrong, and he was right. They had no further plea to advance, and they returned to their work. On publication-night, however, it was found that the machine was out of order—the cylinders screeched and moaned, but would not go round. Post-time came, and not a copy was worked off; and the post for that day was lost. Still the machine would not move; and the "forms," as a last resource, were carted to a neighboring printer, but for whose kindness in lending his machine the paper could not have appeared at all. When the engineer came to examine into the cause of the failure, it was proved to be the result of wanton malice, and was finally traced to the very malcontents who had originated the difference which had lately been the subject of debate.

Things quite as bad as this I have seen in my own experience. I might go on, and swell the hateful list of industrial crimes—for they are nothing less—to the end of a much longer chapter than I should be permitted to publish in these columns; but I have said enough on that head, and may be spared the pain of further revelations of the kind. There are things, however, of a less detestable and suicidal description, which, inasmuch as they prevail to a far greater extent, and are more or less tolerated as recognized customs among working-men, call perhaps yet more loudly for animadversion. They may not be crimes, though the honesty of some of them is more than questionable; but they are meannesses, intensely disgusting and annoying to a truly independent spirit, while in practice they are nuisances to those who are compelled to submit to the infliction, and are, some of them, wofully oppressive to individuals out of favor with fortune. First of all, there is the "footing" nuisance, which is practically a fraud committed upon an unfortunate comrade by those who are better off. Again and again have I seen a poor fellow, after tramping hundreds of miles in search of employment, mulcted of an amount equal to half his week's earnings, to provide his shopmates with the means of drinking his health, forsooth—as though his health would not profit more by the substitution of decent garments for the rags that cover him, and the purchase of which has to be delayed for a week or two longer, till he recovers from the expense of the footing. The worst of it is, that by the time he has done that, his extra services may be no longer wanted, and he has to foot it fifty miles further, to pay another footing when he again gets work. This system not only defrauds but demoralizes the tramper, because it justifies him in levying a contribution wherever he cannot obtain employment, until at length it comes to pass that he travels as much with the intention of raising subscriptions as of working at his trade. Workmen are everywhere loud in their complaints on the score of tramp-levies; if they resolve, as they should do, to stop the supplies thus raised, they must, to strike a just balance, abolish the footings.*

Next, as to the periodical feastings which generally take place towards the close of summer. Where these are fairly got up, and conducted on a reasonable plan, they constitute pleasant and cheerful reunions, agreeable and advantageous to all parties. If the employer chooses to pay any portion of the expense incurred, I see no reason against that; but it is an unjust and disgraceful thing that, in addition to the cash he disburses towards the annual dinner or supper, or country excursion, he should be made to pay indirectly an amount that may happen to be ten times as large. In establishments where material of any kind comes in in the rough and goes out in the finished manufactured state, it is the practice that those who supply the rough material are taxed to pay the expense of recreations for men who are not *their* workmen, but the workmen of their customers. The tax is levied by deputations from the houses they supply; and as an attempt to escape it would damage their connection, it is invariably paid—and as invariably, there can be no doubt, repaid in the charges made for the goods supplied. The practice is disgraceful; and the wonder is, that men in good situations, and earning, as they do, comfortable incomes from year to year, should continue to countenance it.

* In many respectable houses in London, this reform has been effected in whole or in part, the footing being abolished altogether, or the payment of it deferred until the new hand has received six weeks' wages.

Another senseless and cruel anomaly is the tyranny of some of the trade-union laws, against which the victims have no appeal. In many trades, the union has decreed for the protection of the operatives, that a specified amount of wages shall be paid for a specified number of hours per week, and that no man shall work for less. The wages are calculated according to the value of the time of an efficient workman; and for all who come up to that standard, the law may be supposed to work beneficially. But in all trades there are men who are not efficient workmen, and from natural inaptitude and various other causes, never will be so. Most of them are perfectly conscious of their want of skill, and would be glad to compound for such lower rate of wages, as would farly remunerate their labor. This, however, they are not permitted to do; and their combination law puts them in the condition of a merchant who, having certain goods to sell, is condemned to sell them for more than they are worth, or not to sell them at all. The consequence is, that the inefficient workman, who has the same right to make the most he can of his labor as the best, is virtually shut out of the labor-market, and, except during seasons of extraordinary demand, can rarely find employment; and when he does find it, is sure not to keep it long. I could write down from recollection a score of names of such men, who have been driven from post to pillar for the best part of their lives, and have endured in consequence all manner of misery, who might have obtained permanently comfortable employment, but for the law which forbade them to work for less than the established wages. It is of no use to urge, in reply to this, that such men have their remedy in the opportunity which is open to them of working at piece-work. In many occupations, work cannot be paid by the piece, and in others, where it might be so paid for, the custom of piece-work does not prevail; and again, it will often happen that the piece-work of an untaught or half-taught hand must be valued in the same ratio as his time. The combination law, therefore, does all it can to condemn such a man to idleness, and should be replaced by one that would allow every man, whatever his abilities as a workman, to make the most of them, and to secure half a loaf when he cannot get a whole one.

I shall mention but one offence more, and that is as much a public nuisance as it is an individual meanness: I allude to the practice which working-men, who are sent out by their employers to labor, have of levying drink-mail from the inmates of the houses where they work. Why is it that when the tiler comes to repair my roof, the carpenter's man to mend the floors, the smith to restore the locks, the plumber to make good the frostbitten pipes, the plasterer to whitewash the ceilings, or the painter to give a coat of paint—why is it that I should be expected to find them all in beer? Am I an enemy to each and all of these professionals, and do they resent my appeal for their services by spoiling my cellar or my purse? If not, on what grounds is the demand made? Is the demand a threat? If I don't furnish the beer or the beer-money, will the roof continue to let in water, the pipes to let it out?—will the whitewash turn out anything but white, and the paint never get dry? Positively, I have a fear that something of the sort will happen, and therefore it is that I hand over the buksheesh, and not because the fellows deserve or ought to have it. I think them little better than knaves, and I know them to be blockheads, for asking it; but I submit to the trumpery extortion, to escape the risk of a serious inconvenience to which it is in their power to subject me.

To all these things, then, and to more of the kind, or analagous to them, of which he has no need that I should inform him, I would draw the workman's attention. What are they all but the means of purchasing contempt at the paltriest price? What becomes of the dignity of labor while these things are tolerated? It is nonsense to talk of dignity to those who want decent self-respect. If the workman is paid for his work, what right has he to exact more?—and why should he descend from the equality upon which he ranks with his employer, so long as he gives value for value, and make a beggar of himself? What right has he to disgrace his whole class by turning pauper, as he sometimes does, enforcing his beggar's petition by a threat, implied if not expressed? thus reducing the "independent laborer' to a level not far above that of—a practitioner who shall be nameless.

Look at this sort of thing, my friends, in its proper light, and learn to loathe it utterly, in all its shapes and aspects, multitudinous as they are; and until you can do that, don't dream that *you* are in any way connected with the dignity of labor. Get upon higher ground. In all your doings, do as you would be done by. Render to every man his due, and expect and accept no more for your service than its appointed wage. Your dignity is bound up with your independence, which must begin at this point. If you cannot lay this foundation, you need not expect even to come at the knowledge of what is meant by the dignity of labor.

NOTE.—The dignity of labor question is well understood in the United States, and there being no position of political or social distinction, which is not within the reach of the man who labors for his maintenance, if not mentally disqualified or morally disabled by his own acts; hence, we say that the above picture belongs to England, from whence it came. Labor is nowhere more dignified than in this country, where freedom from political and social disability is regarded as the best antidote for the degradation of labor. To effectually degrade labor, we have but to disqualify (from hereditary considerations), the man who performs it, from enjoying the political rights and privileges conferred upon others—make him understand that the blood which courses through his veins is not dyed with royalty hue, that his antecedents were not of the privileged class—and you incite a spirit of envy, which seeks to mar the enjoyment of those rights in others, of which he is deprived by unequal legislation. Labor is stigmatized, and the man feels himself degraded. Nowhere, within the geographical limits of our mother earth, is labor more fully appreciated than in the United States. But even here there is a marked distinction in the dignity attached to different kinds of labor That which requires the largest admixture of both the mental and physical, is that to which the greatest amount of dignity is, and should always be, attached; labor without the exercise of the mind is mere drudgery, like that performed by the horse or the ox, and can be done much better by steam. It is the mind that makes the man; hence, we say that all political and social distinction, aside from moral qualification, re-acts upon those departments and in those channels of society, from whence the disqualify-

ing clauses originated, or by whom they are sustained,—and fully proves *that a little liberty, like a little learning, is a dangerous thing.* Let the writer of the above article but once realize the advantages of Republicanism in England, in the enlarged sense, and he will soon find that men can find higher motives for enjoyment, and a more effectual means of securing them, than those debasing modes of extortion, for which English labor is now distinguished.—[EDS. U. S. NAUT. MAG.

ON THE TEREDO, OR SALT-WATER WORM.

(By JAMES JARVIS, Esq., of Portsmouth, Va.)

Read before the National Institute at Washington.

I HAVE read various records of these dangerous and alarming animals. As a preface to my own observations, I will transcribe from some two or three writers on the subject, and then simply relate whatever knowledge of the animal I have obtained practically. Tredgold speaks as follows:

"The bottom of ships, and timbers exposed to the action of the sea, are often destroyed by the pipe worm, or *Teredo navalis* of Naturalists.

"This creature is very small when first excluded from the egg, but soon acquires a considerable size, being often three or four inches in length, and sometimes increases to a foot or more in length. Its head is provided with a hard calcareous substance, which performs the office of an auger, and enables it to penetrate the hardest wood. When a piece of wood constantly under water is occupied by these worms, there is no sign of damage to be seen on the surface, nor are the worms visible till the outer part of the wood be broken or cut away. Yet they live so near the surface as to have an easy communication with the water by a multitude of minute perforations. They were originally brought from India to Europe.

"Wood is eaten by them till it becomes like a honey-comb; yet there is an evident care in these creatures never to injure one another's habitations, for the divisions between the worm-holes are entire though often extremely thin.

"The fir and alder are the two kinds of wood they seem to destroy with the greatest ease, and in these they grow to the greatest size. In oak they make slower progress, and appear smaller and not so well nourished. They never touch bitter woods, and in solid or hard woods they make slow progress. Charring the surface of wood is not found to be of any use. A mixture of lime, sulphur, and colocynth with pitch is found to be a protection to boards and the like, and rubbing the wood with poisonous ointments is a means of destroying them. A mixture of tar, pitch, and the animal hair separated in tanning was formerly applied with a sheathing of wood to keep it on, and lately the hair has been felted to apply under copper; or a covering of thin copper with felting tarred between it and the wood, is the best protection for the bottoms of ships from all marine animals."

A professor of natural history in one of the colleges of France, many years past, gives the following description of the animal:

"The Genus *Teredo.*—Mouth prolonged into a tunnel much longer than the two little rhomboidal valves, and terminated by two short tubes, the

base of which is furnished on each side with a stony and moveable palette. The Teredo penetrates while young into the wood which it finds submerged, when by the aid of its valves it digs out for itself a residence, enlarging it as it grows in size."

From another professor of natural history I take the following record:

"The Teredines, or *ship-worms,* are celebrated for the ravages they commit by boring into ships' bottoms, piles of dikes, bridges, &c.

"These are mollusks with a very elongated and almost vermiform body, which is enveloped in a tubular mantle open at the anterior and inferior part of the passage of the foot. It is provided posteriorly with two very short distinct tubes, and its bore is furnished on each side with a moveable stony plate; the shell is composed of two rhomboidal valves, but is very small, and covers a very small portion of the mantle.

"It seems that the animal, by moving the extremity of its shell, like an auger, excavates in submerged wood the hole which serves as its abode; and as it advances or buries itself deeper, it lines the excavation with a calcareous matter, so that in a short time it finds itself lodged in a stony tube which at first might be mistaken for a second shell. It begins its attack upon wood when very young, hence the external opening of the gallery is very small; but it digs on until the termination of its growth, and progressively augments the size of its dwelling. The two tubes which occupy the posterior extremity of the mantle always remains near the opening of the gallery, and through one of them it causes the water necessary for its respiration and nutrition to enter; for it always remains in its hole, mouth down, and the anus above. The *common Teredo,* which is about six inches long, it is said was brought from the torrid zone; but it is widely spread in the seas of France, and infests the dikes of Holland to such an extent, that its unperceived ravages have more than once been near producing terrible inundations. Vessels have been sunk by holes bored through their bottoms by these animals.

"To guard against such accidents, is one amongst the reasons why ships' bottoms are covered under water with thin sheets of copper."

Refer to the London and Rees's Encyclopedias, and you will get about the same history as quoted above. I therefore close all that others have said, and submit my own practical knowledge relative to these terrible enemies to the commercial world.

Whatever information I have obtained of these michievous animals I have gained by practical observation. In the first place, these shell-fish are never known in *fresh water;* therefore, they are not to be found in our lakes. The most suitable name for them would be, in plain English, the *salt-water worm.* I have no other reason for the name, than to convey the idea to readers, that these distinctive animals are not met with in wood whilst in fresh water lakes, rivers, and creeks. During the last war with England, the shipping which was not protected with copper bottoms in the harbor of Norfolk, were taken up into James river and other inlets of fresh water, that they might be secure from the ravages of these shell-fish.

In 1849 I received an order from Commodore Joseph Smith, Chief of the Bureau of Yards and Docks, to commence a series of experiments on wood; since which time I have been actively engaged, when not at my other legitimate duties, in conducting the experiment in and on various substances connected with wood.

One course of experiments I conduct with a view of ascertaining, if possible, the best preparation to hinder the ravages of the salt-water worm (Teredo) in wood. I prepare in the spring of the year a large number of blocks of wood, in size generally about twelve inches in length, eight inches in breadth, and about four inches thick, the thickness being about the medium thickness of the bottom plank of a frigate. The pieces are dressed nicely, with smooth surfaces, and deposited in the Elizabeth river opposite this Navy Yard, in the month of April. I use all the paints and other substances extant which I have reason to believe will keep the water from acting on the wood. Amongst the pieces thus prepared I deposited a number of pieces *unprepared*; with the blocks I also deposit small boxes made of thin pieces for the sides and ends. The boxes are also prepared with all the paints extant—part of the boxes are also unprepared, for the purpose of inviting animals to adhere to them. I commence about the twelfth of June to examine the blocks and boxes. I have never been able to discover any of the animalculæ until about the 20th of June. The examination takes place as follows: The blocks and boxes are taken from their locations and wiped clean and dry of the fucus and barnacle. After a strict examination, and seeing no orifice, I apply a magnifying glass, with which I run over the surface; no hole appearing where a minute animal might have entered, I take a fine shaving off the surface, and then apply the glass again. About the 20th of June, annually, I begin to discover a minute hole; I then cut around the orifice, and see a very small white bulb of almost invisible matter. I remove the atom by lifting it on the point of a fine needle, and place the object under the microscope, where I see developed the Teredo, or Salt-water worm, perfect in all its parts, and capable of cutting wood for its subsistence. As soon as the shell-fish is discovered, the *crust* which protects the animal can be also seen formed around it. Daily the animal continues to *grow ahead*—I say grow a head, for these creatures have no locomotive powers; they have neither arms, legs, nor fins, but grow like an oyster; they are a gelatinous substance; their habitations are only in wood. As they grow, they manufacture a calcareous sheathing adhering to the surface of the burrow. The animal grows as that envelope of lime increases in size; but at all times the shell-fish seems to fill the latter. During the summer they grow from six to twelve inches in length, and generally to about three-eighths or half an inch at most in diameter, in Norfolk harbor. The worm excavates a tunnel equal to twelve inches in length and three-eighths of an inch in diameter; the wood excavated would be more than a cubic inch, if in a solid piece. The body of the worm and its shelly envelope, if in a solid, would not be half its contents. What becomes of the wood excavated?

I continue to place the blocks in the river until after frost; I have never (so far) discovered any sign of the shell-fish in any of the pieces of wood deposited after the 29th of September. It may be relied on as to the harbor of Norfolk, and I suppose of the Chesapeake Bay and its tributaries, up stream as far as the water is sufficiently salt, as the salt-water worm does not hatch before the 20th of June of each year, and that they do not enter, after the 30th of September of each year. The shell-fish being hatched before the 30th of September, will continue to do damage until the cold destroys them or the wood is broken, and they die and waste away in their alcoves. In the harbor of New-York I suppose their development commences some

time about the first of July. I am not sure, but I believe that they will keep developing the whole year in the waters as far south as Charleston, S. C., as well as in all the warm climates, the West and East Indies, &c. In the harbors of Boston and Portsmouth, New Hampshire, where we have Navy Yards, the worm does but little injury. Piles driven for any of the bridges crossing from Boston to Charleston, or crossing the river from Portsmouth to Kittery, Maine, will not be injured in a number of years; the worm in those harbors is small in appearance, like vermicelli threads used in soups. The damage done to piles in those harbors is at high and low water marks; there seems to be a pause when the tide is done running up or down, and at those two points only are these animals mischievous in those harbors. It is said that they are not as destructive near the New-York city side, either in the North or East river, as they are on the Brooklyn side or the Jersey side. I have seen wood seriously injured on the Long Island (Brooklyn) side; and have been well informed that the piles driven at the different ferries on the New-York city sides (North and East) are but little damaged, compared to the injury done in the Bay betwixt the Navy Yard, at Brooklyn, and the city of Williamsburg, Long Island. One thing is certain: all vessels employed in the New-York trade should be protected from these enemies to commerce. I suppose the cause of the worm not developing near the wharves of the city, is the great quantity of filth which must run off into the river, and may act as a poison to the animal. In the harbor of Baltimore, as high as the basin, the worm does not appear, and as far down in the harbor as Fell's Point, the animal does but little damage. Rafts of timber remain in the docks all the summer months, without being injured. It is not advisable to risk a vessel's bottom, *unprepared*, as low down as Fort McHenry; and nowhere in the Chesapeake Bay. I believe it dangerous to risk, unprepared, vessel's bottoms in any river or inlet five miles from its mouth, that empties into the Chesapeake.

In the harbors of Boston and Portsmouth, N. H., it is unnecessary for piles to be charred, or to have the bark on, or to have paint and other substances on them; for the timber is secure from serious damage by the shell-fish for twenty-five years, and that will be as long as the timber exposed to open air will continue clear of other decay. I would prepare or leave the bark on all the piles which I should drive in the harbors of New-York and Baltimore; for I believe that in a very *dry season* the worm will develop in the harbor of Baltimore below the basin. There have been such seasons. I am sure it will be found more safe to have all piles driven near the wharves of New-York city, on the East or North river, *prepared* against the salt-water worm. In this harbor and its vicinity, it is positively necessary that the piles be protected, that is, that they be driven *in bark*, or preserved in another manner as made plain in this communication.

The bottom plank of a ship *unprotected* here, and kept submerged one summer, will be destroyed. The *inside*, that is, the wood *betwixt* the out and inside surface of the plank, will be riddled to a honey-comb in appearance; and although so riddled, there cannot be seen a hole on the surface where the animal *enters*. I underscore the word "enters," because one writer says that "the worm *enters* into the minute pores or perforations of the wood." It may be so—these animals may *enter;* but I doubt it; and I doubt that any man, living or dead, ever saw one of these animals "excluded from the egg." As soon as they are brought forth (no matter how), they commence their

ravages. On the surface of the wood exposed there is never a visible sign of an orifice whilst the wood is wet. Mark this: the sixteenth of an inch from where we may say is the embryo, they have grown to a size in diameter equal to the distance *grown ahead.* These animals have a head or bivalved auger, two parts working on a hinge something like small pearl cups, with fine cutters (teeth), that look under the microscope well adapted to the destructive purpose, were the substance a custard to pass through, instead of being, as it often is, a hard pine knot. How strange it is that these creatures will perforate the hardest wood. I often believe that they have a power (perhaps a peculiar acid) with which the hardest substances can be softened and perforated.

These destructive animals have posteriorly two minute tubular inlets, through which the water as well as oxygen can be drawn. When a vessel's bottom is examined that has not been prepared against the attack of the worm, by exposing the bottom to the sun so as to *dry it*, hundreds of these tubes can be seen thrust through the surface, that were visible when the bottom plank was first cleansed of the weed. It is to get a supply of water to moisten them, that they make use of their membranous tubular appendages.

One authority says, they were originally brought from India. I am almost certain that the aborigines of this country had to take their canoes out of the water to preserve them from their ravages. These animals, with all their destructive powers, never bore through a ship's bottom plank—never pass through it to open space. The empty boxes which I have had in the river prove this beyond all doubt: more than one hundred boxes have been examined, and not an orifice to be seen on the inside of the box, and no place of entering on the outside surface; all the parts that are injured by the worm, are *betwixt* the out and inside surfaces. If two pieces of wood are fitted together close, these mollusks will pass on as if it were a solid block. They are the secret agents, the cause of many ships being "in the deep bosom of the ocean buried." So far as I have seen, there is no wood, bitter or sweet, except the cabbage-tree, that the worm would not attack or *enter.*

I have prepared many of the empty boxes by painting them, leaving a small part, the edges, *bare*, purposely to invite attack; and have never failed to have the animal in abundance. I have prepared rods not more than one-fourth of an inch in diameter, with different kinds of paints, leaving one end bare; the worm would appear at the *bare* end, and bore on to the other end of the rod, one foot in length.

The boxes prepared with paint have not been damaged, except from the injury commencing at the select part left *bare* or unprepared. The boards of the boxes were generally three-eighths of an inch thick; by holding the box up to the light after the death of the animal, the meandering of the worm can be traced coming *very* close to the outside, and as close to the inside surface; but never passing through into the water, or to open space inside of the *surface.* As they progress through the wood, they take care to keep in separate cells; and how strange it is, when their mouth-pieces come to an inconceivable thinness of the outside surface, or very near one of their species, they "try back"—turn from the opening they would cause by interfering with their neighbor's habitation.

Many vessels proceed to sea having parts of their bottoms destroyed, which is unknown to the captain, owners, or underwriters. One nail-hole

in a sheet of copper neglected, having no nail driven in to stop the vacancy, might be the cause of the loss of a ship; for wherever the water has access to the wood, certainly, there the worm will be found. A ship with a copper bottom may be in Norfolk harbor, and her bottom supposed to be perfect; at the same time one or two sheets of copper may be off, and the worms may have completely destroyed the *inside* of the plank that is betwixt the inner and outer surface. This perforated part of the bottom may strike against a hard object at sea, the plank be broken in, and the ship lost. I do not doubt the above has frequently been the case. Where a ship's bottom is not protected with copper, frequent search should be made for these animals, by which many lives might be prolonged, and valuable property saved.

It has been observed by a writer, that these animals do a great benefit to commerce by destroying the floating wrecks at sea, and sunken logs in harbors.

In specimens of wood which are left in the river for more than one season, there will be found, after the winter has passed away, the animal alive in many of the cells. There will be seen also many cells without the animal; after its death the shell gets broken, and the animal (a mere paste, is washed away by the waters.

I believe I have said enough of these enemies to the commercial world, to all foundations requiring piling, and to the wood material generally, wherever kept in the salt water in a temperate climate.

In regard to the preventives against the ravages of these destructive creatures, I will offer a few remarks.

Tredgold says, that they never touch bitter wood. I tried all kinds of wood used in building; they bore all. He also says, that charring the surface is not found to be of any use. He is certainly mistaken: no worm is found in charcoal; it is too pure. The charcoal must rub off before the worm can do damage; a pile may remain submerged for a century, if the charred part be perfect. Should the charred part be worn off by the ebbing and flowing of the tide, and the wood be subject to the action of the water, the shell-fish is sure to appear. One great neglect in charring is, that the heat required to burn the wood to charcoal on its outside surface will cause a disruption, a fissure, that the fire does not reach: this *crack* remains uncharred, the water reaches the naked wood, and the terrible animal appears. Fill these fissures or cracks with hot coal-tar, and the piles will be safe as long as the charring is perfect, and the coal-tar does not pass off—or you might fill the fissures with two or three coats of white lead, white zinc, red lead, tallow, or any good strong-bodied paint, and the piles would be secure as long as the charring and paints remained uninjured. Sheets of copper are used by all the mercantile and naval world as the very best article. It lasts longer and is cheaper in the end than any other metallic substance. Iron soon corrodes and becomes loose, the barnacle and sea-weed fasten on it much more than on copper; sheets of zinc have been used, but they soon wear away; lead is too heavy.

Any strong-bodied paint, such as white zinc, white or red lead, verdigris, Ross's metallic, Edward's red—three coats of these paints will secure the bottom of a ship one or two years from the salt-water worm. Three coats of hot coal-tar and three coats of hot naphtha applied to dry wood that the pores may be filled with the liquid will keep the animal off, provided these

substances are not rubbed off so as to leave the wood naked. It is quite possible that, after a year or two, the paint would become insipid and come off in sheets or scales—familiarly called "scaling off;" whenever this takes place, the wood is in danger. The coal-tar and the naphtha may, in a year or more, pass off by being dissipated, drawn out by the flowing and ebbing tides. It is certain, that as long as the above substances retain their purity and can be kept *on* the wood, the wood will be protected from the water; and I am sure the worm cannot develop unless the water reaches the wood.

It has been suggested, that if wood were first saturated with corrosive sublimate and then well painted, it would be an excellent preventive. It would most certainly protect the wood from the ravages of the worm; but it would be found to be quite troublesome to saturate the bottom plank of a large ship before or after it was put on the frame of the ship. *Three* coats of white zinc paint would have the same effect to keep the animal from the wood, as the poison and *two* coats of white zinc paint.

The bark of all trees, as long as it can be kept on, is positively one of the best securities for piles, except copper: copper is superior to all metals or substances known as regards protection from the ravages of the salt-water worm. White zinc paint is superior to copper in keeping the coral deposits off of the bottoms of ships. The deposits in the West Indies are in the form of vegetation, viz: trees with their branches, all tubular, and containing insects. In Norfolk harbor, the common barnacle and often the oyster are the deposits. These accretions are great hindrances to the sailing of ships: when a ship's bottom is filled with sea-weed, or the common barnacle, or any coral formation, the sailors say the ship is "very foul," and cannot sail fast.

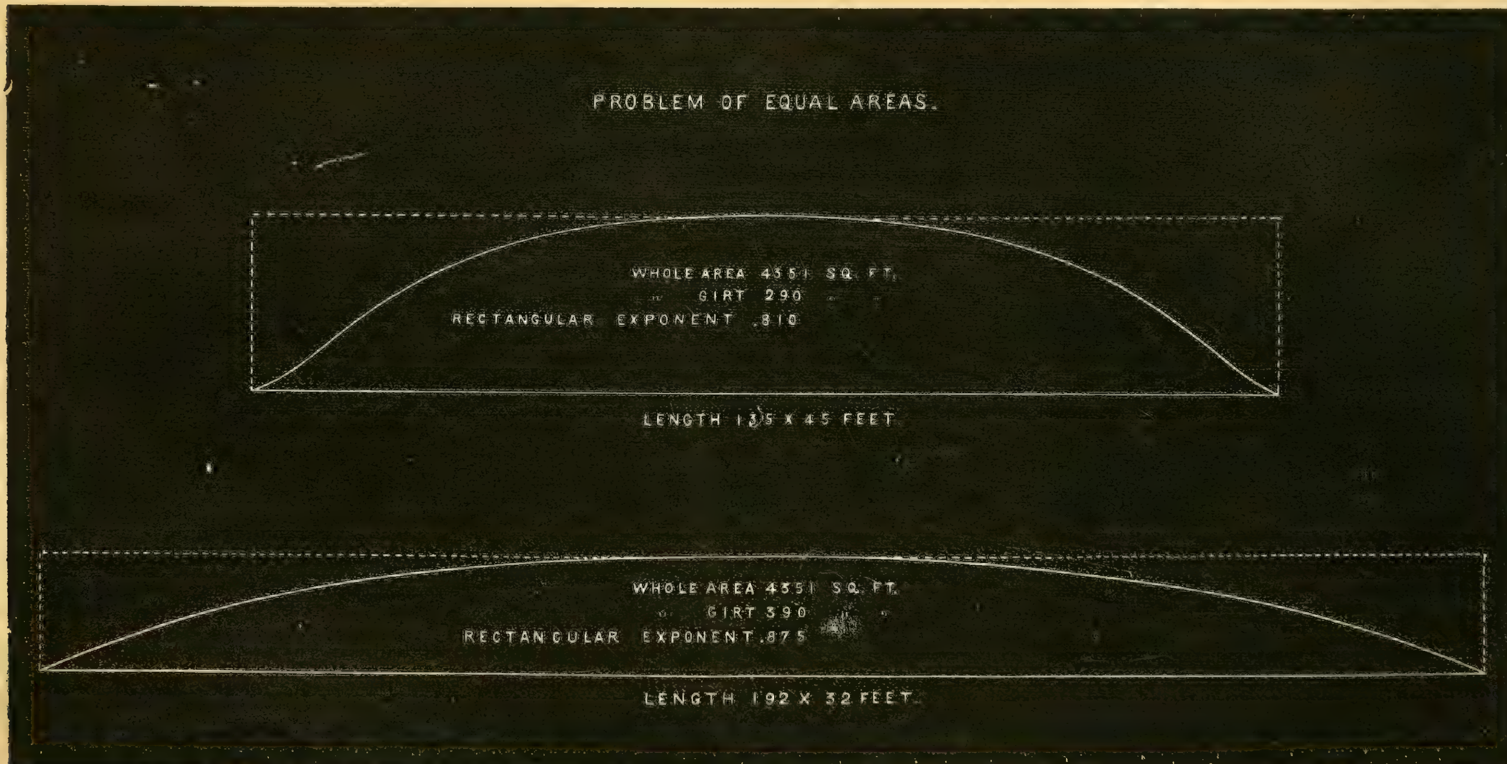
If the Hon. Secretary of the Navy would grant me permission to secure the bottoms of ships from the salt-water worm, and from coral deposits, I would put three coats of white zinc paint on the *dry bottoms* of all ships in the Navy: then copper the bottoms; and, to make the whole invulnerable to the worm and to coral deposits, I would put three more coats of white zinc paint on the outside surface of the copper.

To preserve piles, I would drive all I could with the bark on. There is no danger whilst the bark is kept on. The barnacle on *piles* does no injury. Charring is excellent, provided the fissures are well filled with *hot* coal-tar, or some other substance of equal virtue, such as the paints already named. White zinc paint will be found excellent to keep the shell-fish from the wood where piles may have the bark broken off before being driven.

I believe that three coats of white zinc paint are next best to copper as a preservative against the ravages of these destructive evil-doers.

In conclusion, I do most earnestly hope that this paper may call the serious attention of naturalists towards investigating the origin of the salt-water worm, to lend their aid in discovering a remedy to keep the animal from developing or *entering* into wood.

ONE of the Emperors of Japan is said to have killed himself with immoderate laughing, on being told that Americans were governed without a king.


PROBLEM OF EQUAL AREAS.
WHOLE AREA 4351 SQ. FT.
" GIRT 290 " "
RECTANGULAR EXPONENT .810
LENGTH 135 X 45 FEET.
WHOLE AREA 4351 SQ. FT.
" GIRT 390 " "
RECTANGULAR EXPONENT .875
LENGTH 192 X 32 FEET.

APPRENTICES,

OR, PUPILAGE IN SHIP-BUILDING.

WE again tender our services to this class of learners, upon whom rests the responsibility of sustaining the well-earned mechanical reputation of American ship-builders, when the present incumbents shall have retired from the field of laudable emulation. We would not be understood as confining our remarks exclusively to minors, inasmuch as very many of those who hold the relation of pupils have crossed the threshold of manhood, and by their indomitable energy have acquired an amount of mechanical knowledge, not inconsistent with the elevated position of ship-builders. In this land of freedom, the pupil of to-day may be the builder of to-morrow—we may discover the importance of improving every available means of acquiring an amount of knowledge commensurate with the responsible position, when the tide of events shall tender its services to launch us upon its lubric wave. We have not been wholly disappointed in our efforts to secure the attention of correspondents to our proposals. We have a favor from one who addresses us in the following note:

MESSRS. EDITORS:—Which of the two series of principal dimensions given below (both to be modelled into the best possible forms, and to be rigged in proportion to their ability to carry sail), would be the *best sea-boat* and the fastest sailer? Could either of them be built to compete with the America or Silvia yachts? Respectfully yours,

W. B. G.

We have assumed the lengths given to be on load-line of flotation, presuming this is what our correspondent intended, although his note states extreme length:

135	192	Load-line Length.
45	32	" Breadth.
9	9	" Depth.

The following formula will be illustrative of the principles embodied in this problem, the accompanying engraving conforming to the given dimensions, and having equal areas:

Feet.	Feet.			
192	× 32.	Area,....4351.	Girt....390.	Exponent of Rectangular girt,.... .875.
135	× 45.	Area,....4351.	Girt,....290.	Exponent of Rectangular girt,.... .810.

	Length.	Breadth.		
America,	88	× 22...	Girt of Load-line,..184.	Exponent of rectangular girt,.... .830.
Sylvia,...	78	× 25...	" " ..150.	" " " .. 730.

We discover by the formula that the vessel 192 feet long has no greater area of load-line than that of 135, and consequently no greater capacity with the same depth; but we also discover that the longer vessel has a greater girt line by 100 feet, that is to say, the long vessel would contain about 26½ per cent. more material in her hull than the short one, and weigh or displace about that much more water than the short vessel at the same draught of water, and would carry less dead weight, by about the same

amount. But this is not all: while the shorter vessel would possess the same internal capacity, she would draw less water, and consequently would have less lateral resistance. This could be made up in depth of keel, but she would at the same time have more stability, and could stand up under a greater pressure of sail; and if we compare her with the America, we shall find the rectangular exponent of the America to be nearly two per cent. greater than if built by the dimensions referred to, and as far as the exponent of dimensions are involved, she would have the advantage of the yacht America—that is to say, if her shape were equally good she would beat the America—leaving the difference of size out of the question—which would give her an additional advantage over the America. As to the Sylvia, we find that her rectangular exponent is about eleven per cent. less than that of the America, which is an advantage, in addition to the increased stability; but the size and shape of the America in a sea way would more than compensate. We cannot avoid the conclusion if we would, that the long vessel shown in the engraving is unstable, and that if the length were extended still farther, without increasing the breadth, that the stability is decreased as the length is increased, unless we placed it all at the centre, when we should find that we had erred in another direction, for the angle of entrance and clearance would still be as abrupt as before, and what we had gained midships in draught of water would be lost in increased absolute resistance, which all dead flats must be. But the reason of reduction in the stability, by increasing the length at the ends, will be found in placing buoyancy at the centre instead of the sides. Extending the ends of a vessel, and increasing the buoyancy in the ends thus extended, is equivalent to diminishing the breadth, and has the same effect upon stability; hence we see the advantage of wide vessels over narrow ones, the wide vessel furnishes the greater capacity with less weight of vessel, also greater stability, and consequently greater proportionate ability to carry sail, and maintain the vertical position. But this is not all; if we do not increase the buoyancy of the ends of long vessels, or lengthen them, keeping the buoyancy in the aggregate the same as before lengthening them, we increase the weight beyond the sustaining power of the vessel, consequently we diminish the longitudinal equilibrium of strength; and if the form of the additional length be not an equitable adjustment, we may disturb the equilibrium of motion also. This, however, would properly be a subject worthy of a separate article, and should form a chapter in itself by the exposition given in the formula, and the subsequent remarks. We shall discover that the vessel 135 × 45, has the best rectangular exponent, the greatest amount of stability, the largest amount of capacity (draught of water considered), and having the elements, may possess the least amount of absolute resistance; consequently, if they were brought within the orbit of a form equal to the America for speed, would beat her, apart from her advantage of size.

BOARD OF TRADE REPORT.

INCREASE OF LAKE TONNAGE IN THE YEAR 1856.

BUFFALO, June 11th, 1856.

Messrs. EDITORS:

GENTLEMEN:—I give you below a list of vessels launched this spring from the numerous ship-yards on our western lakes, with their names, tonnage, and where built. This list does not by any means give the whole number launched, but simply those that I have noticed when looking through exchanges. There are also a large number of vessels on the stocks in various stages of progress, their names and tonnage I will send you when launched.

STEAMERS.

Name.	Where built.	Tonnage.
Western Metropolis	Buffalo	1800
King of Algiers, (c.)	Toronto	600
Gem	Newport	100
Howard, (c.)	Dunville	78
Alida	Saginaw	not k'n

PROPELLERS.

Name.	Where built.	Tonnage.
Mineral Rock	Buffalo	555
Adriatic	Do	595
Tonawanda	Do	800
Neptune	Do	600
Ontonagon	Do	560
International	Do	500
Free State	Do	550
Acme	Do	575
J. Barber	Cleveland	263
Cuyahoga	Do	601
Mohawk	Do	789
Iron City	Do	565
Pittsburgh	Do	606
Ever Green City	Do	560
Alleghany	Milwaukee	550
Inkerman	Kingston	600
Tinto, (c.)	Sorel	400

Propeller Tugs.

Name.	Where built.	Tonnage.
E. P. Dorr	Buffalo	375
Tarlton Jones	Chicago	150
S. A. Page	Oswego	140

BARQUES.

Name.	Where built.	Tonnage.
De Soto	Cleveland	583
B. A. Stanard	Do	603
Adriatic	Clayton	380
Hans Crocker	Milwaukee	490

BRIG.

Name.	Where built.	Tonnage.
E. W. Cross	Oswego	434

SCHOONERS.

Name.	Where built.	Tonnage.
Storm King	Buffalo	380
Racer	Do	377
Correspondent	Do	294
Resolute	Do	294
W. B. Hibbard	Do	294
Kate Hayes	Do	349
C. N. Johnson	Do	368
Rapid	Do	260
Hiawatha	Do	308
San Jacinto	Do	375
J. S. Harvey	Do.	356
Rival	Do	403
Nicaraugua	Do	314
S. H. Lathrop	Do	314
Goldfinch	Do	384
Ostrich	Do	350
Wm. Fiske	Do	400
Granada	Do	312
Bohemian	Do	327
Messenger	Do	353
Baltic	Cleveland	367
Gold Hunter	Do	386
Miami	Do	382
Muskingum	Do	375
M. S. Scott	Do	358
W. B. Castle	Do	218
Vanguard	Do	392
Summitt	Do	318
Star of Hope	Do	382
Midnight	Do	382
E. C. Roberts	Do	400
Sweepstakes	Do	457
S. B. Pomeroy	Do	531
Defiance	Do	350
D. G. Norris	Do	347
Dean Richmond	Do	379
Middlesex	Do	396
J. H. Tiffany	Do	369

Name.	Where built.	Ton'age.
Egyptian	Cleveland	372
J. L. Newhouse	Do	381
Nonpareil	Milan	305
Monteagle	Do	305
Surprise	Do	294
Lively	Do	294
May Queen	Do	300
St. James	Do	302
Emeu	Do	300
Dardanelles	Do	302
Cuba	Do	295
Republican	Huron	334
Clyde	Do	307
Kelpie	Do	165
Shook	Do	361
B. Parsons	Vermillion	320
F. T. Barney	Do	354
New London	Do	340
W. H. Willard	Black River	1?0
John Webber	Do	200
Leader	Do	339
Alliance, (c.)	Oakville	263
Joshua Beard, (c.)	Do	400
Canadian, (c.)	Do	350
Jos. Cochrane	Charlotte	325
Adriatic	Ashtabula	191
S. Bates	Manitowoc	173
H. Rands	Do	136
Guido	Do	168
St. Paul	Erie	400
St. Peter	Do	400
Delos De Wolf	Oswego	350
Algerine	Do	381
Titan	Do	366
Dreadnought	Do	412
R. B. Hubbard	Pt. Clinton	340

Name.	Where built.	Tonnage.
Miami Belle	Toledo	287
Starlight	Saginaw	320
Gertrude	Two Rivers	98
Mary Jane	Sheboygan	85
William Wallace, (c.)	Goderich	50
Kyle Spangler	Black River	350
Rose Donsenan	Milwaukee	133
Advance	Do	265
Shanghai	Do	188
Maize	Perrysburgh	375
C. C. Trowbridge	Detroit	375
Sea Whistle	Do	109
Challenge, (c.)	Collingwood	200
Sioux	Fairport	165
Fremont	Perrysburgh	287
Sir Wm. Head, (c.)	St. Catherines	338
Persia	Chicago	135
Wide Wake	Madison Dock	354
Northern Belle	Clayton	351
Eagle Wing	Do	360
Sardinia	Coldwater	220
Anna Maud, (c.)	Pt. Hope	60
Elk, (c.)	Pt. Robinson	233
Meteor	Wilson, (N. Y.)	85
Revolving Light	Hudson, (N. Y.)	200
Storm Spirit	Pt. Huron	223
Wyandott	Newport	452

SCOW.

Name.	Where built.	Tonnage.
Orleans	Fairport	41

The above list of vessels foots up of

Steam Tonnage	12.912
Sail Tonnage	33,441
Total	46,353

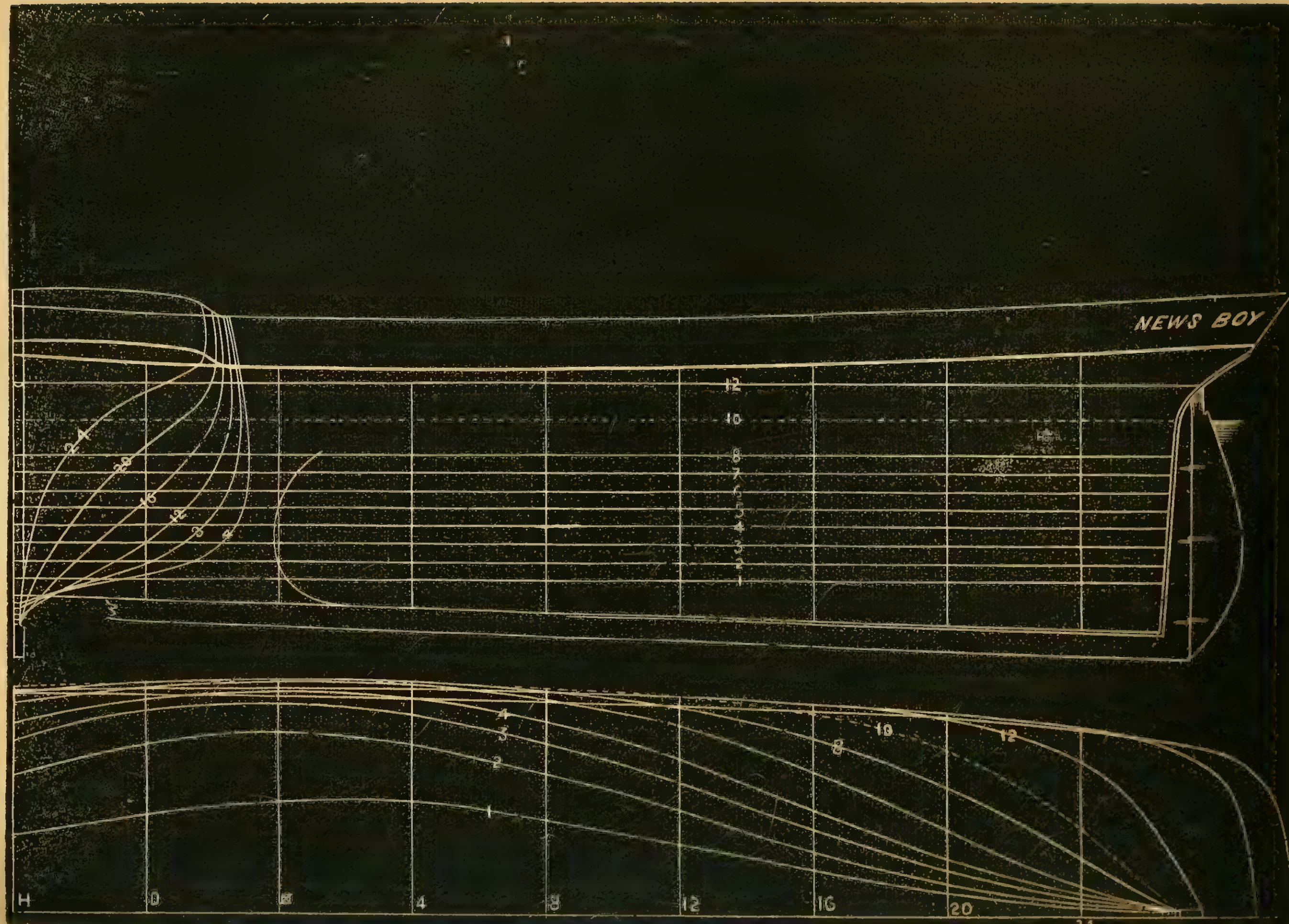
There are several propellers and sail vessels on the stocks at this port.

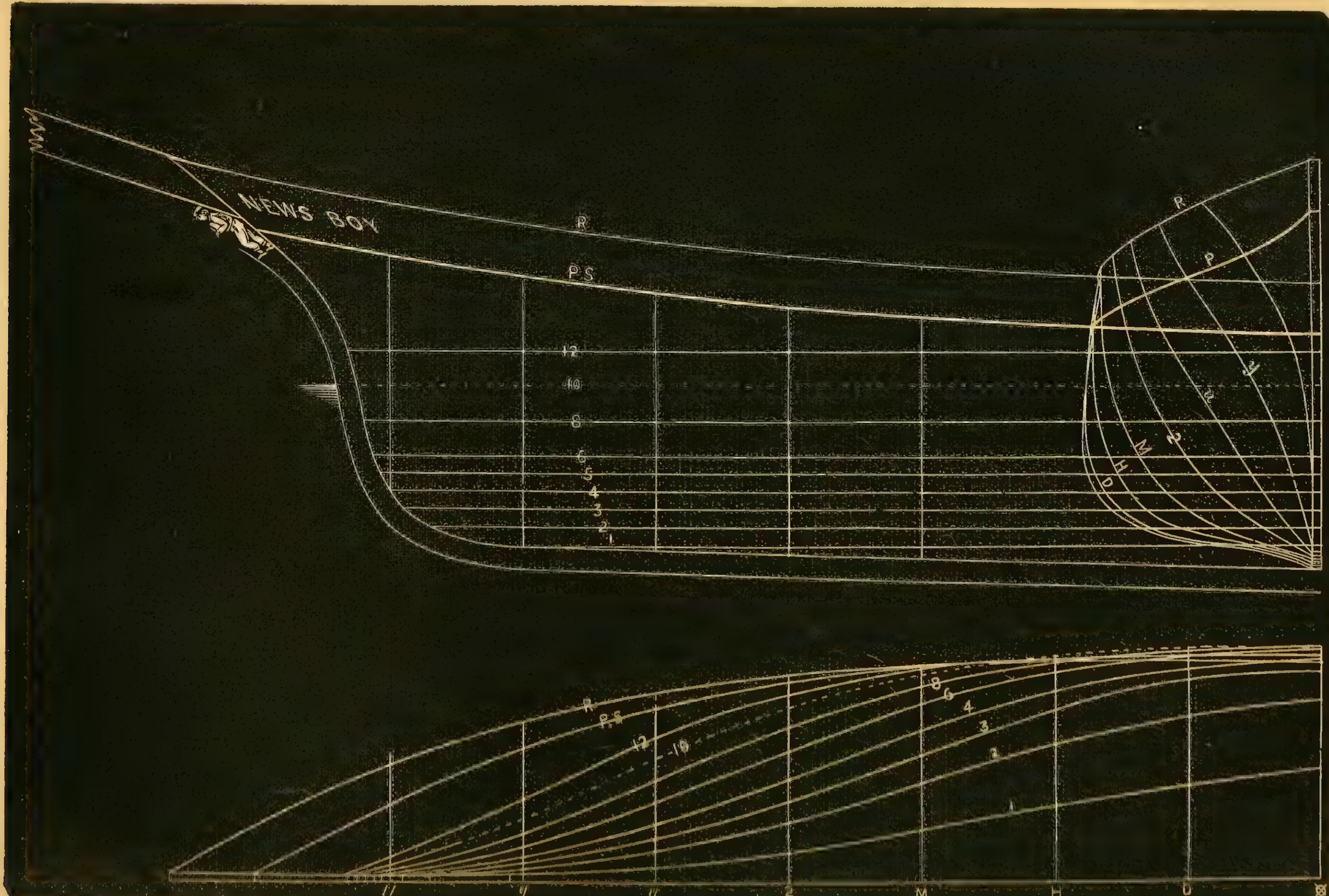
John J. Henderson,
Secretary Buffalo Board of Trade.

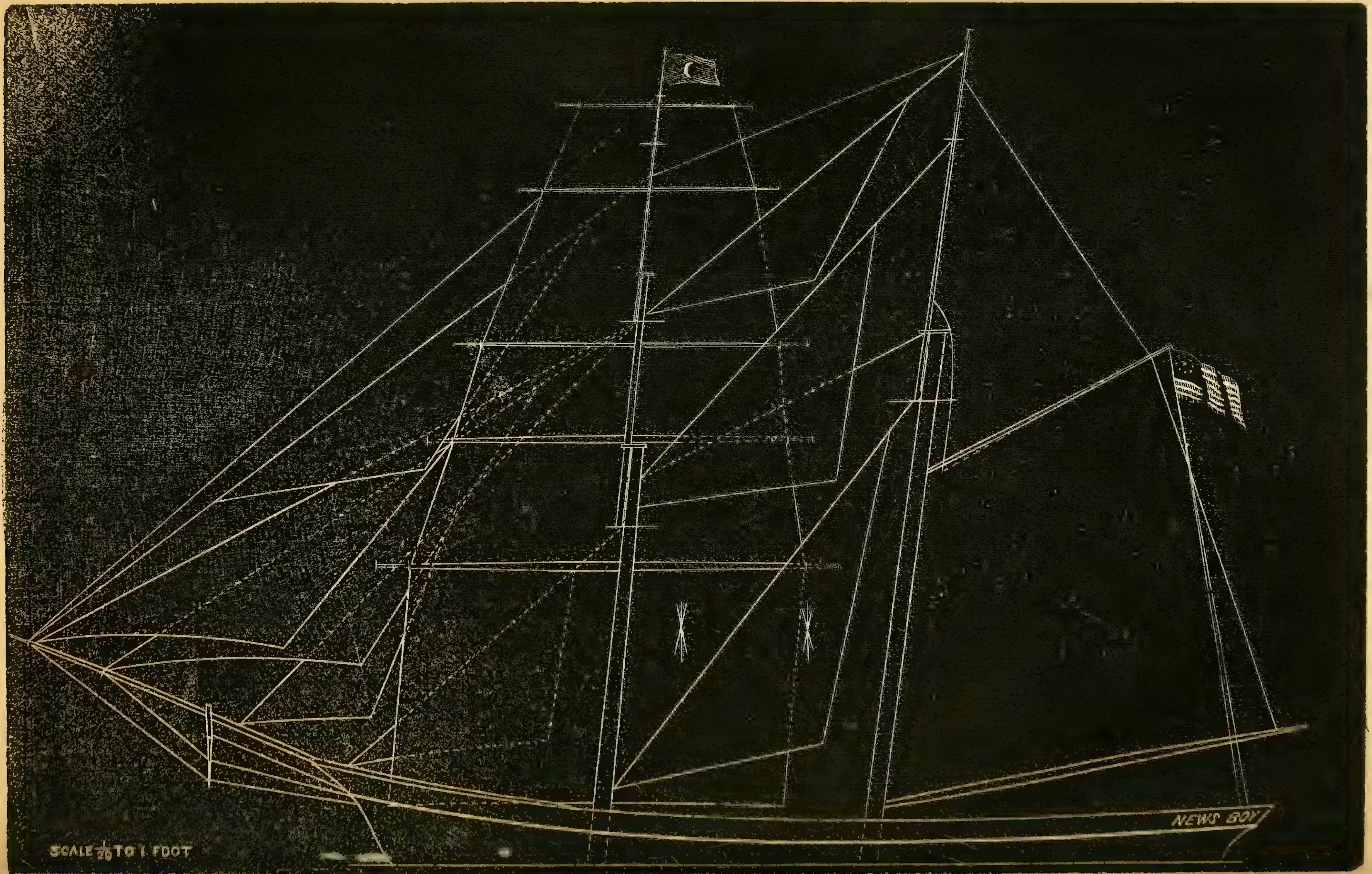
CITY OF WASHINGTON.

Length, 319 *feet.* *Beam*, $40\frac{1}{10}$ *feet.* *Hold*, $27\frac{5}{10}$ *feet.* *Tons*, 2,475.

This steamer lately came from Marseilles to England for repairs, (having run stem on to the pierhead there,) and came the whole distance, 2,000 knots, with fore-compartment full of water. This vessel belongs to the Liverpool and Philadelphia Steam Ship Co., consisting of the steamers City of Baltimore, City of Manchester, City of Washington, and Kangaroo. The City of Baltimore has made one trip, and the others will be put on the line as soon as they can be got from the English Government, in whose service they are now employed as transports.


NEWS BOY


NEWS BOY


NEWS BOY
SCALE 1/20 TO 1 FOOT

THE CLIPPER BRIG NEWSBOY.

This fine vessel, the lines of which will be found in the present number, exhibits a model of no ordinary stamp, and furnishes additional proof that experience alone is not a reliable standard by which to judge of the altitude of a man's scientific attainments in the line of his profession. The Newsboy was modelled by Mr. D. J. Lawlor, of Chelsea, Mass., boat-builder, and built by Captain Elisha Brown, at Owl's Head, Me., (mouth of the Penobscot river). She was launched in June, 1854, and sailed on her first voyage on the 20th of the following month. By the courtesy of her owners, Messrs. Dabney & Cunningham, we have been furnished with the model, log-book, and spar-list of this vessel. She is not only a favorite with her owners, but also with Capt. Leckie, who commands her. Having earned a reputation for speed, by wringing reluctant laurels from her competitors, who have chanced to fall in company with her at sea, she has proved herself well adapted in utility of outfit, economy of space for comfort and convenience, as a despatch vessel, for the service for which intended. Her cost was about $20,000. We are not advised whether this was the first effort of a boat-builder; but be that as it may, the immersed lines may be studied to advantage by ship-builders. If we were so disposed, we could have but little fault to find with her bottom. Speaking in general terms, her appearance above water might be improved somewhat. She does her designer no discredit; her accompanying log will also speak for itself. Success to the Newsboy.

BRIG NEWSBOY, FROM FAYAL TOWARDS BOSTON.

Date.	Course.	Winds.	Dist.	Lat. by Ob.	Lon. by Ob.	REMARKS.
1855. May 18,	....	....	....	....	....	Comes in a fresh breeze from N. N. W. At 1 P. M. got under way from Faya Roads, and kept vessel waiting for passengers. At 3 P. M. all passengers on board. Made sail and stood out to sea. Ends a light breeze from N., and fine pleasant weather.
May 19.						
12 M.	N.W.	N.N.E.	....	....	....	A light breeze from N., and fine weather.
6 P. M.	....	....	....	....	....	At 8 P. M. got to the west end of Fayal.
Midnight.	....	....	....	....	....	During the night fine weather.
6 A. M.	....	E.N.E.	48	38.25	29.41	Ends much the same.
May 20.						
12 M.	N.W. ½ W.	S.W. by W.	....	....	....	Light air from S. E., and fine weather.
6 P. M.	N.W. by W.	S.W.	....	....	....	All drawing sail on our course.
Midnight.	N.W. by W.	S.	....	....	....	Middle part pleasant. A fresh breeze, and increasing.
6 A. M.	N.W. ½ W.	S.E.	115	38.41	32.15	At 11 A. M. exchanged signals with an English barque.

Date. 1855.	Course.	Winds.	Dist.	Lat. by ob	Long. by ob.	REMARKS.
May 21.						
12 M.	N.W.	----	----	----	----	A fresh breeze from S. W. by W., all sail by the wind on the larboard tack.
6 P. M.	W.N.W.	----	----	----	----	At 3 P. M. wind hauled to N. W., tacked ship to W S. W.
Midnight	W.N.W.	----	----	----	----	Ends a fresh breeze and fine weather, all drawing sail set on our course by the wind.
6 A. M.	N.W.	----	128	38.53	34.56	
May 22.						
12 M.	N.W. ½ W.	N.N.E.	----	----	----	Comes in a fine breeze from N. N. E., and fine weather.
6 P. M.	"	----	----	----	----	All sails set on our course, by the wind.
Midnight.	"	----	----	----	----	Middle part a light breeze.
6 A. M.	"	----	176	39.31	38.34	Ends fine winds, all drawing studding sails set, with a six knot breeze.
May 23.						
12 M.	N.W.byW.	N.byE.	----	----	----	A pleasant breeze from N. E.
6 P. M.	N.W. ½ N.	----	----	----	----	All drawing sail set on our course.
Midnight.	"	----	----	----	----	During the night a light breeze.
6 A. M.	N.W.byN.	----	88	39.53	----	Ends much the same. All hands painting vessel.
May 24.						
12 M.	W.byN.	N.byW.	----	----	----	Light breezes. All sail by the wind on starboad tack.
6 P. M.	N.W.byW.	N.byE.	----	----	----	
Midnight.	W.N.W.	N.	----	----	----	Continues fine weather, wind very light, and variable from N. W.
6 A. M.	W.byN.	N.	113	39.42	----	Ends much the same.
May 25.						
12 M.	N. ½ W.	----	----	----	----	A light breeze from N. N. W., and fine weather, by the wind on starboard tack.
6 P. M.	W.N.W.	----	----	----	----	
Midnight.	N.N.W.	----	----	----	----	During the night light airs from the westward.
6 A. M.	N.byE. ½ E.	---- Variable from westward.	65	40.16	----	Ends a fresh breeze and cloudy; all sail by the wind on starboard tack; saw two ships bound westward.
May 26.						
12 M.	N.N.W.	----	----	----	----	Fresh breezes from westward, and cloudy; all sail set by the wind on larboard tack.
6 P. M.	N. ½ W.	----	----	----	----	At 10 P. M. wind light and variable, tacked ship to W. S. W.
Midnight.	W.N.W.	----	----	----	----	Middle part calm.
6 A. M.	S.W.byS.	---- Variable from westward.	73	41.13	----	Ends a fresh breeze from the west. At 11 A. M. tacked ship to N. N. W.
May 27.						
12 M.	N.W.byN.	West.	----	----	----	A fresh breeze, and increasing all sails by the wind on larboard tack.
6 P. M.	N.W.byW.	"	----	----	----	At 10 P. M. took in light sails. Middle part strong breezes and foggy.
Midnight.	"	S.W.byW.	----	----	----	At 2 A. M. reefed mainsail and topsail. Ends calm, and thick fog and rain.
6 A. M.	N.byW.	W.	162	----	----	A heavy swell from W. S. W.
May 28.						
12 M.	N.W.byW.	----	----	----	----	A thick fog and rain, a high swell from W. N. W.
6 P. M.	N.byE. ½ E.	----	----	----	----	Middle part a light air and clear.
Midnight.	N.W.byW.	----	----	----	----	Ends a light breeze from E. N. E., thick rain and fog. Sun obscured.
6 A. M.	N.W.byW. ½ W.	---- Variable from westward.	54	----	----	

Date. 1855.	Course.	Winds.	Dist.	Lat. by ob.	Long. by ob.	REMARKS.
May 29.						
12 M.	N.W.byW. ½ W.	E.N.E.	----	----	----	Thick fog and rain, a light air from E. N. E.
6 P. M.	----	----	----	----	----	Middle part much the same.
Midnight.	----	N.E.	----	----	----	Ends a fresh breeze from N. E. and cloudy.
6 A. M.	----	----	129	----	----	All drawing; studding sails set; on our course.
May 30.						
12 M.	N.W.byW.	N.byW.	----	----	----	A fine breeze from N. N. E., and thick, cloudy weather.
6 P. M.	"	N.E.	----	----	----	All drawing sail set; on our course.
Midnight.	W.N.W.	"	----	----	----	Middle part strong breezes.
6 A. M.	W.byN.	N.N.E.	207	41.55	56.58	Ends strong breezes and clear weather; hard luck, as the wind is keeping us in the gulf stream.
May 31.						
12 M.	W. ½ N.	S.W.	----	----	----	A strong breeze from N. W., all sail by the wind on the starboard tack.
6 P. M.	----	----	----	----	----	Middle part light breezes and cloudy.
Midnight.	N.W.byW.		----	----	----	Ends a light breeze from S. W.
6 A. M.	N.W.byN.	N.byW.	101	41.56	"	All drawing sail set on our course.
June 1.						
12 M.	N.byW. ½ W.	----	----	----	----	A light breeze from S. W. At 3 P. M. took in studding sails, wind hauling to westward.
6 P. M.	N.byW.	W.byN.	----	----	----	
Midnight.	"	"	----	----	----	Middle part strong breezes and a sea making on, took in all light sails.
6 A. M.	"	West.	172	43.53	----	Ends strong westerly winds and clear weather.
June 2.						
12 M.	N.W. ½ N.	----	----	----	----	A strong west wind and a short sea on.
6 P. M.	N.W.	W.S.W.	----	----	----	Heading by the wind on the larboard tack. At 8 20 P. M. tacked ship south.
Midnight.	S.S.W.	West.	----	----	----	Middle part fresh breezes and hazy. At 6 30 A. M. tacked to N. W.
6 A. M.	N.W.	W.S.W.	68	43.66	63.10	Ends clear.
June 3.						
12 M.	N.W. ½ W.	----	----	----	----	Strong breezes at times from S. W., all sail by the wind on the larboard tack. At 7 P. M. made the land about Halifax, N. S. At ditto tacked ship to S. S. E.
6 P. M.	W.N.W.	----	----	----	----	
Midnight.	W.byS.	----	----	----	----	During the night fresh breezes and hazy.
6 A. M.	----	----	----	----	----	At 9 A. M, tacked ship to S. E.
10 A. M.	S.E.byE.	---- Variable from southward.	----	43.28	----	The land about two miles distant at noon; boarded the schooner Fairbreit of Westport, fishing on Sable Bank; she asked to be reported.
June 4.						
12 M.	----	S.	----	----	----	A strong breeze and hazy, all sail by the wind, on our course.
6 P. M.	----	----	----	----	----	
Midnight.	----	S.S.E.	----	----	----	Midnight a fine breeze on our course, going twelve miles per hour finely.
6 A. M.	----	----	----	----	----	At noon saw Race Point, and shaped our course for Boston. At 5 P. M. took on board a Boston pilot. So ends this voyage.

From the English Nautical Magazine.

THE MAGIC EFFECTS OF MARINE INSURANCE.

Under this quaint title, a correspondent has sent us the following, which appears to contain a curious account of the loss of the *Schomberg* on the coast of Australia. For our own part, we have always been at a loss to see what the *Schomberg* had to do so close in shore as to have the baffling winds of the cliffs; and we believe there is some truth in his remark, had such a case occurred with one of Her Majesty's ships. But, no doubt, it was all right and ship-shape; for it is said the *Schomberg* was insured, and the good folks abroad are ready for another. You will observe, says our correspondent, that Capt. Forbes, of the *Schomberg*, has been acquitted for the loss of that vessel. I apprehend, if the case had taken place with a vessel of the Royal Navy, the result would have been very different. Such is the indifference to loss under the operations of Marine Insurance, that, although the *Schomberg* had a very valuable cargo, I do not hear a complaint from any quarter about loss of property; and as no lives were lost, and the Captain and officers acquitted, *we are ready for another* similar loss, without any one caring a straw about it.*

The Story of the Schomberg, told by herself.

I was a fine large ship, a good ship too, tight, strong, and well fastened. I left Liverpool on the 8th of October, but on the 26th of December I ran on shore and got knocked to pieces on the rocks. In the evening they saw something like land, and I thought I could take care of myself, so on I went for it, for there was no one who seemed to care about me. And soon afterwards I found myself getting well in with the land; indeed, I got so far in that when I wanted to put my head outwards again, not exactly liking the appearance of the berth I had chalked out for myself, I was not able; and as I could not get it round any way on shore I went into a place they call Cutler's Inlet, between Cape Otway and Portland. To be sure there was a sand-bank outside of me, and some rocks too, to which I was not accustomed; in fact, I knew nothing about them, nor of the tide or current. All that I know was that I got there, and do you see I was better there than in many other places I could name, for you see every one got on shore snug enough, for it was a nice light night, so that every thing was done as it should be. But there was a great hubbub among the passengers, for you see they were raw, and not up to such work, and they wanted me to anchor, as if there was any occasion to do so, or to make a fuss about getting on shore as well as they could—boat or no boat; wasn't there plenty of spars and such like for those who could not swim, and those who could might do

* The stereotyped reply on this side of the Atlantic is, "Fortunately, she was insured."—Eds. U. S. Nautical Magazine.

very well for themselves. I had been jolly enough the day before, those on board little thinking this was to be my last; but I was bent on it, and so I kept my cables unbent, and dashed myself bows end on right on to the beach, for some one told me, and I heard them too, that the insurance was all right. And now I am feeling that I have not got so easy and quiet a berth as I have had, as my ribs are fast separating from each other, and all the rest of me will be in all directions very shortly, which will be all right, and you will not be troubled any more by

"Your insured,

"SCHOMBERG."

DISPOSAL OF ANOTHER BRITISH MERCHANT SHIP.

The Local Marine Board of the port of London, in pursuance of directions from the Board of Trade, have instituted an inquiry into the loss of the ship *St. Abbs*, Bell, from London for Bombay, which took place on St. Juan de Nova.

The Court then inquired of Capt. Bell whether he had any evidence to offer.

Capt. Bell replied that he had, and proceeded to read the protest which he had made as to the loss of the ship. The ship being tight, staunch, and strong, and properly equipped for the voyage, sailed from London bound to Bombay, on March 5th, 1855; and nothing important occurred. Sighted Madeira on the 29th of March, 1855. Sighted the island of Bourbon at midnight, during the hours of eleven and twelve of the night of the 10th of June; at daylight, made all sail, steering N. W., at eight steered N. N. W., and at nine steering N. by W., during the morning of which I got good careful observation, to find the rate of my chronometers, and *I found them correct.* I then shaped my course to go between the Island of Madagascar, and the island of Juan de Nova, intending to give the latter a berth of sixty-five to seventy miles, according to its position, as represented on my chart, published by Blachford & Co., at London, dated 1848. On the 14th of June, at noon, my lat. was 11° 56′ S., and long. 52° 5′ E., steering from that time N. by W. and N. by W. ½ W., with strong current setting W. N. W., and a strong wind at S. E., with passing squalls of rain, and the variation one point, which would carry me in a fair way between the two islands above named. At six, P. M., in topmast studding-sail, being more wind; at seven, P. M., in main royal mizzentopmast gallant-sail, and set up preventer mizzentopmast backstays. At eight relieved the watch, sent the second mate to the fore part of the ship to tell the watch to keep a good look-out for ships. When he came aft I inquired of him who had the first look-out, as it was usual to do so before leaving the deck. He answered me, "Richards," and the other man, whose name I do not remember. At 9.50 I gave him

orders for the night—to keep a good look-out, and to call me if there was more wind, and if less, to make more sail. The night was rather dark and overcast, ship making 9 knots to 9½ per hour, with a strong wind. At ten I left the deck in charge of the second mate; at 11.30 went to bed.

At 11.30 I was called by the second mate, who told me the water had a strange appearance a-head, the water being all white. I then jumped out of bed in my drawers, and ran to the poop-deck, and saw the broken water, about three times the ship's length a-head. I ran to the man at the wheel, and hove the helm hard a-starboard with him; but, before the ship had time to answer, she struck forward, and then aft, striking as her head was paying off, until she came broadside to the sea, striking very heavily, and the sea breaking over her. At this time I let all the halyards go, fore and aft. I gave the order to clew up the sails. The ship now lurched heavily to windward. I ordered the mainmast to be cut away; but, before anything was cut, the mainmast went by the deck, taking in its fall the foretopmast and mizzentopmast, and falling over the starboard side; and by this time the ship had got her head to sea. My first object was to see if the boats were uninjured in the fall of the mainmast; found the long boat all right, but the second boat was damaged, and the third boat was all right. I then ordered the crew to get the third boat on the poop-deck. The second boat I told them to let remain. After that being done, the chief mate and the carpenter went to sound the pumps, when the mate told me they were choked by the gear of the mainmast. The chief mate and one hand went into the lower hold to see what water there was in the ship. He reported about five feet. I told the crew that were about me to look well round to see if we could see any land, but I saw nothing. I then called the remainder aft and told them to go into the cuddy till daylight, and then we should see what was best to be done. Myself and chief mate went into the cuddy to get some clothes on, when the crew asked me for a glass of grog, when I told the steward to give them one. After that they turned to on their own account, and drank beer and wine, and smoked segars, until they were completely stupid by daylight, having by this time finished 3½ dozen of ale, and 2½ dozen of sherry wine, and, I am sorry to say, three of the passengers joined in with them.

At day-light found the ship had struck upon a reef, the two islands being connected by the same; the ship one and a half miles west of one, and six miles from the other. I then commenced to clear the long boat, as we kept our sheep in her; we split the chocks out, and got the boat ready by nine o'clock; put some bread and water, chronometers, and a chart and compass, ship's log-book, ship's papers, wine and beer, and carpenters's tools and nails into her; and it was my intention to build a boat on shore out of the wreck of the ship. But my greatest difficulty arose from not being able to collect the men together, as some were drinking, others eating bread and cheese and

ham, they would not pay any attention to what orders myself or my chief mate gave. At ten we launched the long boat into the water, all safe; the chief mate and two hands jumped into her to receive the rest, but to my surprise, I found they were not willing to follow. I begged and entreated of them to follow the mate into the boat, so as to get her away from alongside of the ship, but in their delay, and the sea being so heavy, she beat alongside of the ship, till, to our dismay, she filled with water, and went to pieces in about thirty-five minutes, and with great difficulty we got the men on board again. The tide by this time began to flow by the reef, and so put an end to our doing anything more this day, the crew and passengers still eating and drinking, and found they had opened some of the one dozen cases of brandy in the between decks, which accounted to me for the state they were in. Up to this time the ship gave no signs of breaking up although the weather was very bad. At dark they began to lie down in different places in the cuddy, the mate and myself on the move till daylight. The second mate during the night begged of me to give him laudanum, for what reason I did not know, nor would he tell me. On the morning of the 16th got a coil of rope up, and got a lot of small line ready. At seven got a spare topmast over the side of the ship, with a rope bent on in the form of a bridle, in the hopes that this would ground on the reef, and so form a communication between the ship and the reef. I then asked my chief mate to go with our last remaining boat, to try if there was a passage from the reef to the island. He replied to me that he could not swim, and the boat could not live. I then asked the second mate if he would go; he replied that he could not swim, and the boat could not live. I then proposed going myself. I asked who among the crew would go with me, upon which Bouch, an able seaman, and a man named Edge, and another named Fitzgerald, said they would go and try what we could do.

The boat by this time was got ready, having been slung by the middle with a rope six fathoms long, so as, when the boats should touch the water, the rope would unreave, and so clear the ship. I then told the mate to make fast a small new line to the boat, thinking that if the boat should capsize, there might be some chance of getting back to the ship again, and if we reached the reef, it would serve for a hauling-line to the reef. The greater part of the crew by this time was much the same as before stated, at 11 30. It was now time to endeavor to make a landing on the reef, in hopes to find a passage to the nearest island. The three men before named and myself got into the boat, the chief mate standing by to slip the rope, and as the boat was slipping, one of them named Fitzgerald, jumped out of her again, and so went the boat. The first sea hove the boat 20 fathoms from the ship in the direction of the reef, the second one capsized her. The first man who left the boat was Bouch. The boat now turned bottom up. Myself and Edge got on her bottom, and I saw Bouch had a footing on the reef.

When Edge saw this he left the boat, and so did I, and we all three reached the reef. In my efforts to do so, the back water was so heavy, I very much cut my legs and feet by the coral, and my strength very much exhausted. I then, according to promise, made my way the best I could to the nearest island, finding the reef at some parts dry, and others three to four feet of water, and one place eleven feet water. Some time afterwards reached the island, and then sat down much exhausted. I then stuck some bushes on a piece of bamboo in the ground so as to show those on board that there was a passage to the island. I then went to the lee-side of the island to see if there was any person on it, but no one. I then was returning to the reef with the man Edge, when I met the carpenter and Mr. Ross, and Bouch and Richards, who told me the tide was flowing, and no chance of returning, so I was obliged to remain, in hopes of getting back the following day, this being about two o'clock. Spent the remaining part of the day in watching the ship. Passed a miserable night, our only shelter being the bushes, and, during the night, the wind blew very heavy. When daylight came, found the ship had broken up. At eight o'clock saw a portion of the wreck, with three persons on it, but having no boat, could not render any assistance. By eleven the tide had fallen. Bouch and the carpenter and myself went to the scene of the wreck to see if we could render any assistance, but found no person. Picked up some brandy and gin, and brought them to the island. About one hour afterwards the man Richards was mad drunk, and the others had quite sufficient. After this time we continued much the same, going on the reef every day to see what we could pick up, the carpenter and the man Richards most of the time drunk. At the full of moon made a raft and crossed over the reef to the largest island, distant six miles, and on the second day myself and the carpenter went in search of water, and found a well and two huts; returned to the others next day at daybreak. We all went to it, and here our condition was better, having now found fresh water. In this state we lived sixteen days, when the schooner *Uraine*, of Mahe, came there for turtle, and the Captain kindly took us on board and conveyed us to Mahe, having sailed from Juan de Nova July 23, and arrived at Mahe August 2. My crew, on my arrival at Mahe, demanded money of me to sign my protest, they having got persons to come forward and offer to advance me money on my cargo. Because I would not assent to their proposals they would not sign. Mr. Ross, passenger, and the civil commissioners, demanded of me a passage and outfit equal to what Mr. Ross had lost; because I would not do this, he then became my most bitter enemy. My crew, and the civil commissioners together, because I would not abandon my cargo to their satisfaction to obtain money to give them, caused my arrest, and would not allow me to write to my owners without the letters being read over b the civil commissioners. He then read the protest which he had made at the Mauritius.

MASTER'S CERTIFICATE AND CHARTS.

The Local Marine Board of London having inquired into the circumstances attending the loss of the *St. Abbs*, East Indiaman, and having reported that Alexander Campbell Bell, late master of that vessel, had been proved incompetent, and was guilty of gross misconduct, the Board of Trade have, after consideration of the report and evidence, cancelled his certificate as master. The following passages in the report of the Local Marine Board demand special notice:—" The chart used by the master was laid before the court. It is marked, 'Sold by Blachford and Imray, 116 Minories, new edition, 1848,' in which Juan de Nova is laid down in long. 52° 30′ E.—the true longitude given by Horsburgh being 51° 2′ E., and so placed in his chart of the Indian Ocean. It was resolved, that in the opinion of this Board the loss of the ship was mainly owing to the error in the chart; at the same time the Board think the master was highly culpable in not having consulted other authorities in his possession; neither did he use due diligence, knowing that he would cross the parallel of the island during the night; and that after the ship struck, the master appears to have lost all command, and all means that were within his power were not applied for the safety of the crew and passengers."

THE WANTS OF COMMERCE.

A Rule of Tonnage similar to that of the English, as the basis of an International Tonnage Law.

An Institute for Marine Architectural Science.

A Nautical Institute and School for Seamen.

NOTICE TO MERCHANTS.

Changing the Names of Vessels.—Heretofore the name of a vessel once recognized by the government, could not be changed except by a special act of Congress. A law has recently been passed, vesting the power to make such changes in the Secretary of the Treasury, a copy of which we annex:

An Act authorizing the Secretary of the Treasury to change the names of vessels in certain cases.

Be it enacted, by the Senate and House of Representatives of the United States of America in Congress assembled, that the Secretary of the Treasury be, and hereby is authorized to permit the owner or owners of any vessel to change the name of the same, when, in his opinion, there shall be sufficient cause for so doing; and he may establish such rules and regulations as he shall deem proper for that purpose.

Approved March 4, 1856.

THE GUN-BOAT QUESTION SETTLED.

THE "LIGHT CAVALRY" OF THE BRITISH NAVY.

A NEW style of vessel, six in number, has been added to the formidable force of the British Navy, destined (were it not for the timely interposition of the Paris Conference of Peace) for the Baltic campaign of 1856. From the *London Artizan* we extract the dimensions of one of this class of vessels, the superior efficiency of which would not long remain a matter of doubt to those who might be called to witness the operations of such a campaign as the Baltic—provided they could get there, or that they did not draw too much water. They are designed for light draught, however. *Query*—what depth below the surface may be considered light draught?

"THE FLYING FISH."

	Ft.	In.
Length between perpendiculars (on deck)	200	
Length of keel for tonnage	186	7½
Breadth extreme	28	4
Breadth for tonnage (British)	28	
Breadth moulded	27	6
Depth in hold	14	
Tonnage	860 tons.	
Height from deck to deck	6	9
Height from deck to beam	5	11¾

ARMAMENT.

2 guns of 95 cwt., 8 inches	68-pounders.
1 gun of 56 cwt. 6 inches	32-pounders.
4 guns of 25 cwt.	32-pounders.

ENGINES

Of the class known as *Princess Royal* engines, namely, horizontal steeple, with two piston-rods to each cylinder.

Nominal horse-power	350
Diameter of cylinder	58 inches
Length of stroke	2 ft. 3 inches.

They draw too much water for the American coast. What shall be done with them? Place them on the "Inefficient" list.

DISASTERS AT SEA.

STEAMERS.

Etiwan, of Georgetown, D. C., was much damaged by fire, May 28.
City of Newark, (Ferry Boat.) was burnt to the water's edge, in New-York harbor, June 10.
Delia, (steamboat,) was totally destroyed by fire at New-Orleans, June 16.
Mary Bess, (steamboat,) was destroyed by fire at New-Orleans, June 16.
D. S. Stacey, (steamboat,) was destroyed by fire at New-Orleans, June 16.
Pidta, (steamboat,) was totally destroyed by fire at New-Orleans, June 16.
Latona, (steamboat.) was totally destroyed by fire at New-Orleans, June 16.
E. J. Dupont, Baltimore, for New-York, ran ashore near Indian River, June 14, (is a total loss.)

SHIPS.

Helen Augusta, (whaler,) was burnt at Monganui, N. Z., February 15.
Racer, Liverpool, for New-York, was lost on Arklow Bank, Ireland, June 6.
S. C. Thuding, Mobile, for Gottenburg, was lost at Lesso, in the North Sea, May 4.
Chateau Palmer, (French,) was totally lost near San Francisco, Cal, April 28.
Tchernaya, put into Plymouth, Eng., leaky, and with loss of topmasts, prior to May 21.
Peterhof, Charleston, for Havana, was totally lost on Abaco, May 17, crew saved.
Niobe, at New-York, from Calcutta, lost spars, sails, &c., May 28.
Jersey, at San Francisco, from New-York, lost some sails, &c.
Pallas, Cork, Ireland, for Quebec, was wrecked, May 30, at St. Paul's Island, St. Lawrence River, eighty-two lives lost.
Champion, capsized at Havana, June 9. is full of water.
Pantheon, (whaler,) was burnt at the Island of Neukahiva, March 25, and sunk.
Corsica, Calcutta, for Boston, was putting back, April 22d.
Flying Cloud, New-York, for San Francisco, put into Rio Janeiro, June 11, in distress.

BARQUES.

Pacquete de San Yago, (French,) Havana, for Marseilles, put into Charleston, leaky, May 26.
Unknown, (sup'd Eng ,) was seen water-logged and abandoned, April 28, in latitude 41 42 N , longitude 25 W.
Ann, New-York, for New Orleans, got ashore on Orange Key, May 13.
Young Turk, Boston, for Shediac, N. B., sunk near Cape Breton Island.
Glenburn, at New-York, from Leghorn, lost all her sails.
Unknown, was seen, May 19, dismasted, in lat. 12 52 S., lon. 38 18.

BRIGS.

Fanny Whittier, New-Orleans, for Bilboa, Spain, put into Norfolk, in distress, May 27.
Paulita, (Spanish,) St. Jago, for Majorca, put into Boston, leaky, May 29.
Marcellus, Wilmington, N. C., for Amsterdam, put into Nassau, N. P., leaky, May 16.
Icarian, Savannah, for Boston, put back, May 18, with loss of foremast.
Ganges, Sagua la Grande, for New-York, put into Savannah, dismasted, May 26.
Extra, Tobasco, for New-York, was lost near Havana, May 16, (crew saved.)
Rineo, (Swedish,) Matanzas, for Frederickshall, put into Charleston, S. C., with loss of sails, spars, &c., May 28.
Itaska, New-York. for Aspinwall, put back in distress, June 1.
Bolina, (British,) at New-York, from Jamaica, in distress.
China, for New-York, for Philadelphia, was capsized near Sandy Hook, May 27.
Eliza Ann, New-York, for Jacksonville, put back in distress, June 2.
Samuel and Edward, New-York, for Buenos Ayres, was run into by an unknown ship, April 12, (is a total loss)
Harbinger, Cardenas, for New-York, was lost on Fire Island, June 1.
Oxford, sunk in Lake Erie, is a total loss, June 6, five lives lost.
Huntress, Boston, for Key West, put into Charleston, leaky, June 5.
Nereus, Malaga, for Boston, put into Halifax, N. S., June 3, leaking badly.
George Otis, New-York, for St Jago, Cuba, was totally lost near latter port, May 29.
Mermaid, Cette, for Hampton Roads, put into Gibraltar, in distress, May 20.
E. O. Holt, Mansanilla, for New-York, put into Cienfuegos, in distress, May 24.
Pacer, St. Domingo, for New-York, was wrecked on Fortune Island, June 2, (crew saved.)
Taratine, at New-York, from Palmas, Grand Canary, was much damaged, June 4.

SCHOONERS.

Edith, Boston, for Bay Chaleur, was wrecked near Barrington, N. S., May 20.
Shoal Water, was totally lost near Cape Henry, May 22.
Emerald, Rockland, for New-York, sunk in New York Harbor, May 22.
Wakulia, Philadelphia, for Bangor, Me., was totally lost near White Head, May 21.
H. D. Mears, Baltimore, for Boco del Torro, put into Norfolk, May 21, leaking badly.
Henry T. Wood, Alexandria, for Troy, N. Y., went ashore off Cape Charles, May 28, (supposed total loss)
John R. Franklin. Baltimore, for Gardiner, Me., put into New Bedford, much damaged, May 29.
H. Jones, Demerara, for Baltimore, put into Charleston, with loss of sails, May 26.
Martha Russell, Nassau, N. P., for Tampico, was wrecked at Orange Key, W. I., May 13.
Vandalia, Frankfort, Me., for Boston, abandoned, May 31, in a sinking condition.
Chas. Cranmer, New-York, for Richmond, Va., was burnt, June 11, (crew saved.)
Juana, New-York, for Baltimore, put into Philadelphia. in distress, June 19.
Louise, Boston, for Mobile, was lost on Elbow Reef.

NOTICES TO MARINERS.

LIST OF THE MEMBERS OF THE LIGHT-HOUSE BOARD OF THE UNITED STATES.

Organized in conformity to the act of Congress approved August 31, 1852.

Hon. James Guthrie, *Secretary of the Treasury, ex officio President.*
Commodore W. B. Shubrick, *U. S. Navy, Chairman.*
Brevet Brig. Gen. Jos. G. Totten, *Chief Engineer, U. S. Army.*
Lieut. Col. James Kearney, *U. S. Corps Topographical Engineers.*
Prof. A. D. Bache, LL. D. *Superintendent Coast Survey.*
Prof. Jos. Henry, LL. D. *Secretary Smithsonian Institution.*
Captain S. F. Du Pont, *U. S. Navy.*

Commander Thornton A. Jenkins, *U. S. Navy.*
Brevet Capt. Edmund L. F. Hardcastle, *U. S. Corps Top. Engs.*, } *Secretaries.*

LIST OF LIGHT-HOUSE INSPECTION DISTRICTS, WITH THE NAMES AND RESIDENCES OF THE INSPECTORS.

First District.

Embracing all lights, &c.. from N. E. boundary, Maine to Hampton Harbor, N. H.
Lieutenant W. B. Franklin, U. S. Corps Topographical Engineers, Portland, Maine.

Second District.

Embracing all lights, &c., from Hampton Harbor, N. H., to Gooseberry Point, Mass.
Lieutenant C. H. B. Caldwell, U. S. Navy, Boston, Mass.

Third District.

Embracing all lights, &c., from Gooseberry Point, Mass. to Squam inlet, New-Jersey, including Lake Champlain and Hudson river.
Commander A. Ludlow Case, U. S. Navy, New-York.

Fourth District.

Embracing all lights, &c., from Squam inlet, New-Jersey, to Metomkin inlet, Virginia, including Delaware bay and tributaries.
Lieutenant James S. Biddle, U. S. Navy, Philadelphia.

Fifth District.

Embracing all lights, &c., from Metomkin inlet, Virginia, to New-River inlet, North Carolina, including Chesapeake bay and tributaries Albemarle and Pamlico sounds.
Lieutenant A. M. Pennock, U. S. Navy, Norfolk, Virginia.

Sixth District.

Embracing all lights, &c., from New River inlet, North Carolina, to Mosquito inlet, Florida.
Lieutenant C. Manigault Morris, U. S. Navy, Charleston, S. C.

Seventh District.

Embracing all lights, &c., from Mosquito inlet, Florida, to Egmont Key, Florida.
Lieutenant M. Carrington Watkins, U. S. Navy, Key West, Florida.

Eighth District.

Embracing all lights, &c., from St. Mark's, Florida, to Barataria bay, Louisiana, including Mississippi river, and all lakes and bays adjacent to the coast between these limits.
Captain D. Leadbeater, U. S. Engineers, Mobile, Alabama.

Ninth District.

Embracing all lights, &c., from Barataria bay, Louisiana, to Rio Grande, Texas.
Lieutenant W. H. Stevens, U. S. Engineers, Galveston, Texas.

Tenth District.

Embracing all lights, &c., on lakes Erie and Ontario, and the rivers St. Lawrence and Niagara, and their tributaries.
Captain J. C. Woodruff, U. S. Topographical Engineers, Buffalo, N. Y.

Eleventh District.

Embracing all lights, &c., on lakes St. Clair, Huron, Michigan, Superior, and Green bay and their tributaries.
Captain L. Sitgreaves, U. S. Topographical Engineers, Detroit, Michigan.

Twelfth District.

Embracing all lights, &c., on the coast of California, Oregon, and Washington.
——— ——— San Francisco.

The Light House at Cape Florida.—Notice is hereby given that the tower at this place has been elevated 26 feet, surmounted by an iron watch room and lantern, and furnished with a cata-dioptric apparatus of the 2nd order, fixed illuminating 315 deg. of the horizon.

The focal plane of the apparatus is 100 feet above the mean sea level.

The tower and lantern are painted white, (as before).

The new light was exhibited for the first time on the night of the 18th inst. and will continue to be shown from sunset to sunrise, till further notice.

Key West, Fa. March 23, 1856.

Smith's Point, Light Vessel —The light vessel which was driven from her station by ice, off Smith's Point, mouth of Potomac River, Va., will be returned thereto on or about the 28th inst. after which the light will be exhibited nightly from sunset to sunrise.

Norfolk, Va., March, 1856.

Nun Buoys to mark the Gedney's Channel across the bar, and the main Ship Channel around the S. W. Spit to New-York, and can buoys the South Channel across the bar, and Swash Channel to the main Ship Channel, will be placed as fast as the weather will permit, from this date.

March 25, 1856.

The Light Ship on the Five Fathom Bank, went out to her station, from Cape Island, 22d inst.

Notice is hereby given that the following buoys have been placed, viz :—

Salem Harbor—West end of Whale's Back, Spar Buoy, red, No. 8; Pilgrim Ledge, Spar Buoy, red, No 4.

Off Marblehead—Tom Moore's Rocks, black, No. 1.

Gloucester Harbor—Round Rock, Spar buoy, black, No. 1.

Boston, March 31, 1856.

A Spar Buoy, 40 feet long, painted with red and black horizontal stripes, has been placed to mark the centre of Craven's Shoal, below the Narrows, entrance to the harbor of New-York.

It lays in 18 feet at low water, about one mile distant from Fort Tompkins lighthouse, and may be passed on either side.

Compass Bearings.—Port Tompkins lighthouse, NNW ¼ W.

Fort Lafayette, N. by E. ¾ E.

Coney Island Swing, ESE.

April 2, 1856.

The Shovelfull Light Boat has been repaired, and was towed to her station 2d inst, by steamer Island Home.

Notice is hereby given that the Spar Buoys on the following stations in Light House Channel, Boston Harbor, have been taken up, and replaced as follows :—

Point Alderton, 2d class Nun Buoy, black, No. 1.

Toddy Rocks, 2d class Nun Buoy, Black, No. 3.

Hunt's Ledge, 2d class Nun Buoy, red and black horizontal stripes.

False Spit 3d class Nun Buoy, red, No. 6.

Notice is hereby given that the Spar Buoys on the following stations in Broad Sound have been taken up and replaced as follows :

Barrel Rock, 2d class Can Buoy, red and black horizontal stripes.

Ram Head Bar, 2d Class Can Buoy, black, No. 5.

Little Fawn Bar, 2d class Can Buoy, red, No. 4.

Also, that the Spar Buoy on Davis's Ledge, off Cohasset Rocks, has been replaced by a 2d class Nun Buoy, black, with "Davis's Ledge" on three sides.

Boston, April 3, 1856.

A Bell Boat has been anchored off the entrance of the S. W. Pass, Mississippi River, one mile outside the Bar in ten fathoms water. The boat has S. W. Pass, in red letters, on the slopes of her deck, and is painted in black and white vertical stripes. Her bell is sounded by the action of the waves.

The Lighthouse at the S. W. Pass bears from the boat N. ½ W. magnetic; the channel at the bar N.N W ; the pilot's lookout to the village N. by E : and the most seaward mud lumps visible NE. by E.

Mobile, March 28, 1856.

The Frying Pan Shoal Light Vessel has been moored in her old position off the shoal, in ten fathoms of water.

Notice is hereby given that the following Buoys have been replaced in Vineyard Sound:—
Long Shoal Spar Buoy, Red, No. 8.
Tuckernuck Slue, 2d class Can Buoy, Red, No. 2, with "SLUE" on head.
Handkerchief, S. W. part, 1st class Can Buoy, black, No. 7.

Trinity House, Port Adelaide, South Australia,
December 17, 1855.

Lighthouse on the Troubridge Shoals, Gulf St. Vincent.—Light—A bright flashing light, 80 feet above high water mark, visible from the deck of a moderate sized vessel at a distance of sixteen (16) miles, will be exhibited on and after the evening of the 1st of February, 1856.

Lighthouse Position—Variation—Tides—The lighthouse is composed of iron, painted stone color, and is placed on the centre of the Troubridge Island, in lat. 35 10 S., lon. 137 50 15 E., variation 5 degrees E. High water, F. and C., 3 30; the flood sets E. N. E., and then N. N. E. into the gulf.

Sailing Directions—Vessels bound through Investigator's Straits into the Gulf St. Vincent should make the light bearing N. E. ½ N. by compass, and steer N. E. by E. ½ E to pass it a distance of seven miles; having brought it to bear W. by N. ½ N. about eight miles a course of N. E. by N. may be kept for the light ship off Port Adelaide, which bears N. E. ½ E., 36½ miles from the centre of the island. Vessels from the westward and southward should not approach the light within a less distance than four miles, where they will find sounding of 14 fathoms

Tides—The flood tide, during westerly gales, and at the springs, runs with considerable velocity—setting rather on the shoal until the gulf is open.

Anchorage off the Light—Vessels bound down the gulf from the port meeting with westerly gales, will find excellent anchorage under the lee off Troubridge Island, with the light bearing S. W. distance 1½ miles in 8 fathoms, on a clean sandy bottom..

Notice is hereby given that the following buoys have been replaced in Neponset River, viz.—
Farm Point Buoy, black, No. 3.
Middle Ground Buoy, red and black horizontal stripes.
King's Point Buoy, red, No. 6.
Minot's Point Buoy, red, No. 8.
Wood's Point Buoy, red, No. 18.

Also, that a black Nun Boy, of the 1st class, numbered 1, has been placed off the S. E. part of West Island Ledge, in Buzzard's Bay.

A red Nun Buoy, of the 2d class, with red and black horizontal stripes, has been placed near Lone Rock, to the northward of Quick's Hole Passage, Buzzard's Bay.

On or about the 15th inst. the Graves Ledge Bell Boat will be brought in for repairs, and in its stead a black Can Buoy of the 1st class, will be temporarily placed.

Barbadoes.—There is a stationary light established on "Beckwith's Battery." Needham's Point, Southern Point of the harbor of Barbadoes. It is a good harbor light, shows white when to the north of it, and red when to the south of it.

Captain Brown, of the schr. Sidney, at Hong Kong, reported the following shoal:—"With the centre of the low Island bearing S. S. E., distance about six miles, sounded on a coral bank of seven and eight The ship, at the time going fast, could not get but two casts of the lead. It appears to be a continuation of the Diana Shoal; therefore vessels going between Low Island and Haycock should keep within sight of the beach of Low Island, as I could just discern the breakers from the deck on the beach of Low Island, while getting the casts of the lead."

The standard for the Light Ship at Van Weis Dam, Hudson River, New-York, has been carried away by the ice, and cannot be replaced until the freshet subsides. The standard will be erected, and the light exhibited as heretofore at the earliest day possible.
New-York, April 18, 1856.

Notice is hereby given, that the following changes have been made in Boston harbor:

A 2d class Nun Buoy, black, No. 9, has been placed on Upper Middle, in place of the Spar Buoy.

A 3d class Nun Buoy, Red, No. 6, has been placed on the S. E. end of the Lower Middle, in place of the Spar Buoy.

The 2d class Nun Buoy, Black, No. 1, off Port Alderton, which was carried away in the last gale, has been replaced.

By order of the Light House Board.

Boston, April 23, 1856.

Capt. Hunter of the John Mathie, arrived here yesterday, discovered a reef, not laid down on his chart, during a calm, December 5, in lat. 2 39 S. lon. 107 20 E., and had to anchor with 30 fathoms cable in 20 fathoms water, to prevent the ship drifting upon it.—Gaspard Island bearing N. 45 W., north end of Pulo Leat S. 56 W., west point of Long Island, nearly in line with a small island, west point S. 8 11 W., and the reef bearing S. 11 E., distance about a quarter of a mile.

Liverpool, April, 1856.

☞ The Bell Buoy frem Alden Rock has been taken into Gloucester, Mass.

Beacon Light at old Point Comfort, Virginia.—Notice is hereby given that on and after the evening of the 7th of May, a fixed white light will be exhibited on the southwest end of Old Point Comfort, Va , to guide vessels into the anchorage between Hampton bar and the beach.

The light is placed about twenty yards from low water mark, and is elevated on a cast iron fluted column, painted black, 18 feet high, surmounted by a copper lantern 3 8-12 feet high.

The illuminating apparatus is a large sized pressed glass lens.

The elevation of the light above sea level is 22 feet, and can be seen from the deck of an ordinary sized vessel, in clear weather, 8 nautical miles.

Bearings from the light as follows :—

Sewen's Point, S. W. by S. ¾ S.

Buoy on the tail of Hampton bar, S. W. by S. ¼ S.

Rip Raps S. by E. ½ E.

Light House office, Norfolk, Va.

Office of the Board of Health }
Norfolk, May 6th, 1856. }

Ordered, That on and after the 10th inst., all vessels bound to this port from the West Indies, Spanish Main, Coast of Brazil, or from any Port or place south of the latitude of Charleston, where any malignant or contagious disease shall exist at the time of their sailing, be required to come to an anchor at the Quarantine grounds at least one mile below Fort Norfolk, and there remain until visited by the Health Officer, and his permission in writing be obtained for such vessels to enter the Harbor, and that it be enjoined on the Pilots and Harbor Masters to see that this order be enforced—under the penalty of the law.

By order of the Board of Health.

The Ocklocknee Shoal Bell Buoy.—A. B. Noyes, Esq., Deputy Collector of the port of St. Marks, states that the Bell Boat has broke from her anchorage on the Ocklocknee Shoal, and was found by Messrs Stuart and Martin, (Pilots) in the Aucilla Bay, and by them towed back opposite the Lighthouse, where she remains secured, (her clapper tied to prevent ringing) till the Lighthouse Inspector takes charge of her.

Capt. Young, of Brig Lina, mentions the discovery of a new shoal.

Melbourne, December 31, 1855.

"On my passage here I discovered a shoal or sandbank, not laid down on my chart nor mentioned in Horsburgh. It is in latitude 16 3 south, and longitude 150 37 east, bearing from the Diana shoal S. S. E. ¼ E. by compass, and distant about 27 miles. I have called it the Lina's Shoal. It is a dry bank of sand."

Capt. Prescott, Coast Pilot, reports the large can buoy missing from the N. E. part of Great Point Rip, when he passed in ship Fortitude, 11th inst. This is quite an important point to be remarked, and we trust that the proper authorities will give early attention to it.

Notice is hereby given, that the Light House at Bonita Point, heretofore of the natural color of the brick, will be changed on the 21st of April, to white. The Lantern will remain bright red. By order of the Light House Board.

SANFRANCISCO April 10, 1856.

Gloucester Harbor.—Notice is hereby given that Elisha's Ledge (Spar) Buoy, red No. 6, has this day been replaced.

By order of the Light House Board.

Notice is hereby given that the "Harding's Ledge Bell Boat" has been repaired and replaced upon her station, and the 2d class black Nun Buoy removed.

The "Graves Ledge Bell Boat" has been removed from her station for repairs, and a 1st class black Can Buoy temporarily substituted.

Boston, May 1, 1856.

HOUSE OF REFUGE :—The Court of Directors of the East India Company have lately received from the Government of Bengal the following Notification, which is published for general information :—

Houses of Refuge for Shipwrecked Mariners thrown on shore on the sea face of the Sunderbunds, have been put up as follows :—

No. 1.—Painted Red.—Erected just to the northward of Jackson's Grove, on Seyers' Point, forming the eastern entrance to Channel Creek. It is on an extensive plain, covered with short grass, inside or to the eastward of some high sand hills that here line the shore.

No. 2.—Painted White.—Erected at the eastern entrance to the Subtermookey river, 400 yards to the northward of the point that forms from Bulcherry island, and 200 yards from high-water mark. It is in the midst of thick low jungle.

No. 3.—Painted Black.—Erected at the eastern entrance to the Jumera river, 400 yards to the north of the point that forms from the entrance of the Subtermookey river, and 200 yards from high-water mark.

In each house there is a supply of biscuit and water, which will be easily found by reading the instruction put up in each, which also give other directions that will be useful. A catamaran is attached to each house.

Persons cast away reaching land to the east of Saugor, should make search for the Houses of Refuge ; and it should be borne in mind, that when a vessel is lost with a pilot on board, the fact would soon become known at the Pilot Station and in Calcutta. Parties, therefore, finding their way to the houses should remain there, and husband the means of subsistence, in the assurance that succor will speedily reach them ; or, if compelled to leave, endeavor to get westward to Saugor island, and travel along the beach until they arrive at the light-house ; or make their way to a large fishing village, situated on the southeast side of Saugor island, using the catamaran as far as practicable.

Fort William, Marine Supdt's Office.
March 8, 1856.

FIXED LIGHT ON CAPE PEMBROKE.—Official information has been received at the Office of the Light-house Board, that the Colonial Government at the Falkland Islands has given notice that a Fixed Light, of the natural color, was established on Cape Pembroke on the first day of December last.

The light stands at a height of 110 feet above the mean level of the sea, and is visible in ordinary weather at a distance of 14 miles. It shows a bright fixed light in every direction seaward, but is dark towards Port William, between the bearings of N. W. ½ N. and West.

The tower is 60 feet high ; it is circular, and of iron, and at present painted black. It stands in latitude 51° 40 42 S., long 57° 41 48 West of Greenwich. The illuminating apparatus is catoptric or reflecting, and of the first order.

Cape Pembroke, on which a beacon has hitherto stood, forms the easternmost point of the Falkland group, and also the south headland of Port William, within which, on its south side, is Stanley Harbor.

From the Uranei Rock (which lies east one mile from the outer rock off Volunteer Point) the light-house bears S. 13° E or S. by E ¼ E. nearly, distant 9½ miles, From the centre of the large Wolf rock, to the southward, the light-house bears N. 7° E.

A vessel entering Port William will leave the light on the port hand ; and the master should be careful to observe that, as the flood tide sets strongly to the northward, and the ebb to the southward, in passing Cape Pembroke, he should not pass between this Cape and the Seal rocks (which lie northeast of it about ¾ mile) unless the ship is under steam or has a good commanding breeze ; in light winds, or much swell, it is better to pass outside.

All bearings are magnetic. Var. 16¼ E. in 1856.

Washington, April 22, 1856.

Lights at the Harbor of Port Louis, Mauritius.—The following corrected sailing directions for making the anchorage off the harbor of Port Louis, Mauritius, with reference to the light-houses recently erected upon "Flat Island" and "Cannonier Point," and also the two mast lights near the entrance of the harbor, have been received at this office, and are published for the information of mariners:

Description of the Lights.

"*Flat Island*"—This is a *revolving* catoptric light of the first order, situated at the south-west or highest extremity of the island, in latitude S. 19° 53 26, and longitude E. 57° 38 8, determined by triangulation from the observatory of Port Louis. Variation of the compass 11 47 13 west.

Its elevation above the mean level of the sea (the rise of the tide being only about 3 feet) is 366 feet, and it will be visible in clear weather, from the deck of a vessel 13 feet above the water a distance of about 25 nautical miles.

"*Cannonier Point.*"—This is a *fixed* catoptric light, also of the first order. It is situated in latitude S. 20 0 35, and longitude E. 57 32 39. Its elevation above the mean level of the sea is 39 feet 6 inches, and it will be seen from the deck of a vessel 13 feet above the water a distance of about 10 nautical miles.

The objects of this light are to indicate the position of a dangerous shoal nearly 1¼ miles from the shore, and to keep vessels clear of the coral reefs to the northeast aud southwest of the point.

"*Harbor mast Lights.*"—One of these is placed as a leading light (red) at the Martello Tower, at the mouth and on the left bank of the Grand river; and the other (green) at Fort George, on Tonnelier island.

General Directions.

Vessels making the land from the eastward (windward) side of the island, should give a berth of 2½ miles to the reefs of Amber island, and be careful not to approach the light on Flat island on a course to the westward of N. N. W. ½ W., until Gunner's Quoin bears *west*, when they may shape a mid-channel course between Gunner's Quoin and Flat island.

When to the westward of the Quoin, the light at Cannonier Point will become visible, and must be approached with the Flat island light bearing astern E. N. E. ½ N., until abreast of Connonier Point, when that light will bear S. E. by S., a berth of rather more than two nautical miles being thus given to the dangerous reef and shoal off the point. They may then haul up to S. W. by S. for the anchorage, distant about ten nautical miles, taking care to keep the Cannonier Point light *white* for a distance of 6¾ miles, when the Flat Island and Cannonier Point lights will appear in one; the change of this color into red, within that distance, will indicate a too near approach to the land.

The *red* light at the mouth of the Grand river will now be opened, bearing S. S. W., for which vessels may safely steer until the mast light (green) upon Fort George, on Tonnelier island bears S. E. ½ S., when they may immediately let go the anchor, being on the best ground. A nearer approach to the light at Grand river would bring them too close to the reefs.

If the night is clear, the "Corps de Garde" mountain will be clearly seen in a line with the Grand River light.

It is, however, generally advisable for vessels passing Cannonier point at night to lay-to, keeping sail occasionally upon the ship for the purpose of maintainiag a good position for making the anchorage at day-break, in preference of attempting it at night, by which, in a very few instances, any time will be gained. Considerable risk, as well as the necessity for anchoring outside at all, will also be thus avoided.

Washington, April 4, 1856.

Fort Sumter Light-House, Charleston Harbor.—A fixed light of the natural color will be exhibited for the first time on the evening of the 15th of May, 1856, on Fort Sumter, Charleston Harbor, S. C.

The illuminating apparatus will be a fifth order Fresnel Lens, placed in a lantern on top of a brick tower just within the north angle of the outer wall of the fort, and having an elevation of 56½ feet above low water. The arc of illumination is but 2700, and therefore no light will be seen on the shoal water behind Fort Sumter and between Fort Johnson and Morris' Island; but in front of Fort Sumter, all navigable waters from Morris' Island around to Fort Johnson will be illuminated,

May 1, 1856.

Fixed Light at Cape Shablah.—Official information has been received at this office that the Turkish Government has given notice, that on the 1st February, 1856, a light was established on the beacon tower at Cape Shablah, on the coast of Bulgaria, about 36 miles northeast of Varna, in the Black sea.

The light is said to be fixed and bright. It is placed at a height of about 120 feet above the level of the sea, and in ordinary weather should be seen from the deck of a ship at a distance

of about 16 miles. The light-tower stands in lat. 43 33 30 N., long. 28 38 40 east of Greenwich, nearly.

The mariner is warned, that in December, 1852, thirteen vessels bound from Odessa to Varna ran ashore near Cape Shablah, and in March, 1855, six other vessels went ashore between Shablah and Mangali, (a small town which lies 16 miles to the northward,) when bound to Varna from the Crimea As these wrecks may have been caused by a current setting to the west or northwest, masters of vessels should be on their guard against such an occurrence.

They should also remember that lights on the coast of Turkey are uncertain, and not run too confidently expecting to make a light on Cape Shablah.

Variation 7 W. in 1856.

April 30, 1856.

INTERESTING TO MARINERS.—We are glad to notice among the appropriations for the public service by the Canadian government, the following grants of money, which are greatly required in the interests of navigation, both in the Upper Lakes and in the gulf navigation of the St. Lawrence. The following is the estimate of the Board of Works :—

Completion of Works in Progress.

1	Forming and protecting foundations of light-house on Point au Pelee reef	£3,108
2	Light house, Lake Huron	8,000
3	Lanterns, lenses, revolving machinery, lamps, &c., for light-houses in course of construction	13,000
4	Light house in the Gulf of St. Lawrence and Straits of Belisle	15,000
5	Lanterns, lenses, machinery, &c	8,000

New Works Proposed.

1	Light house on Snake Island	2,000
2	St. Maurice River, Slides at the Grais booms, &c., to be taken from proceeds of sales of lumber limits	8,500
3	Towards improvements of Ottowa Navigation for 1856	25,000
4	Towards the works at the head of Richelieu Rapids to prevent inundation, delay in the opening of navigation, and detention of vessels	2.500
	Total	87,149

Making a total of three hundred and forty eight thousand five hundred and sixty-six dollars, or a little short of half a million, towards improving the main channels of navigation on the Canadian frontier.

CASTLE PINCKNEY BEACON, CHAERSTON HARBOR.—A fixed red light will be exhibited for the first time on the evening the 15th May, 1856, on Shute's Folly Island, Charleston Harbor, S. C.

The illuminating apparatus will be a fifth order Fresnel Lens, placed in a lantern on top of an open wooden frame 13 feet square at bottom and ten at top, situated 100 feet to the northwest of Castle Pinckney. The wood work is painted yellow, except the cylindrical part immediately beneath the lantern of four feet in height, which is of a dark brown. The arc of illumination is 3500 and the height at the light 50 feet above low water.

May 5, 1856.

GUNFLEET LIGHT, EAST SWIN.—Official information has been received at this Office, that the Corporation of the Trinity House of London has given notice, that the pile light-house recently erected near the southeastern edge of the Gunfleet sand, off the coast of Essex, in the East Swin, near the entrance of the Thames, being now complete.

A *revolving* light, colored *red*, was established therein on and after the evening of the 1st day of May inst., showing a red face every half minute. It is placed at a height of 48 feet above the mean level of the sea, and should be visible from the deck of a ship, in the ordinary state of the weather, at a distance of from 7 to 8 miles.

The light house is a six-sided structure, of iron, supported upon piles, which are braced together diagonally. The whole is colored red. It stands with the following bearings : Clackton Church, N. W. ½ W. ; Walton Naze Tower, N. ¼ E. ; Harwich High Light-house, N. by E. ; Sunk Light-vessel, E. ¾ S. 4½ miles.

On the same day the lights at present shown on board the Gunfleet light-vessel were discontinued, her mast-head balls struck, and the vessel will shortly be removed. Also the beacon which stands a little to the westward of the new light-house will be taken away.

Masters of vessels, pilots, and other mariners, are strictly cautioned not to approach the light-house nearer than a quarter of a mile, nor under any circumstances to attempt to pass to the northward of it.

All bearings magnetic. Var 21 15 W. in 1856; decreasing 6 annually.

Washington, May 24, 1856.

LIGHT ON THE BALEARIC ISLANDS.—Official information has been received at this office, that the Spanish Ministry of Marine has given notice, that on and after the 1st day of May, 1856, a fixed light would be established on the islet of Los Ahorcados, between Ivica, and Formentera, Balearic Islands, in the Mediterranean.

The light is a fixed white light, placed at the height of 82 feet above the mean level of the sea, and should be visible from the deck of a ship, in ordinary weather, at a distance of 10 miles. The illuminating apparatus is catoptric of the sixth order.

The light tower stands in lat. 38 48 42 N., long. 1 29 east of Greenwich.

The object of the light is to mark the channel known by the name of the Freo Grande, or chief of the three channels or Freos, between the islands of Ivica on the north, and Formentera on the south. This channel is about one mile wide, and has a depth of nine fathoms; but as the bottom is rocky, sailing ships should be cautious in taking it with a scant or variable wind, in order to avoid the risk of having to anchor.

May 30, 1856.

LIGHT-HOUSES AT WINTER HARBOR AND KENNEBUNK RIVER.—A Light-house will be built during the present season on Mark Island, at the west side of the outer entrance of Winter Harbor, Gouldsborough, Maine.

The light shown will be *a fixed white light,* and its position in the List of Light-houses of 1856, will be next after No. 8, (Prospect Harbor light house.)

It will be lighted for the first time on January 1, 1857.

A new light-house will be built during the present season on the pierhead at the mouth of the Kennebunk river.

The light-house will be a small square frame structure, painted white, and the lantern will be square and placed on the outer end of the building. The light shown, will be *red fixed,* and it will be lighted for the first time on January 1, 1857.

In the Light-house List of 1856, this light will come next after No. 37, (Goat Island, or Cape Porpoise light-house.)

Notices giving the heights, distances visible, approximate latitudes and longitudes, and all other necessary information with regard to these lights,, will be published before they are lighted.

Portland, Me., June 12, 1856.

DAY-MARK ON WRECK IN SAN FRANCISCO BAY.—Notice is hereby given that a mark painted red, has been attached to the wreck of the ship Crown Princess, lying in five fathoms at low water, north of Yerba Buena island, San Francisco bay, Cal., consisting of a plank 7 inches by 3 inches, 30 feet long, showing 15 feet above high water, with a board 5 feet long nailed across one foot below the top.

The following bearings (magnetic) and distances (statute miles) give the position.

Alcatras Island light-house,	W. by S.	2½ miles
East end of Yerba Buena island,	E. S. E.	1 "
West end of Yerba Buena island,	S. E. by S. ½ S. .	¾ "
Telegraph Hill,	S. W. ¾ S. . . .	3 "

San Francisco, Cal., May 12, 1856.

The Danish Government have established 21 salvage stations on the west coast of North Jutland, and five on the Isle of Bornholm, furnished with all necessary apparatus for the purpose of saving lives in cases of shipwreck.

The stations are the following—viz., Skagen, Kandestedeine, Hertshols, Sonstruss, Lokken, Blockhusene, Slette Strand, Lild Strand, Hanstedholm, Keitmoller, Nordie-Vonore, Vested-Aggar, Aggar Kanal, Thyto Roso, Flyoholm, Inskiæd, Voederso, Klik, Sonder-Lyngoig, Brenegaard, Hennestrand, Blaavandstruch, Ronne, Allinge, Gudnelm, Slanike, and Snageback.

Quarantine Regulations at Wilmington, N. C.—From and after this date, all vessels arriving from the West Indies, South America, the Gulf of Mexico or any port south of the latitude of Cape Fear, are requested to stop at the Boarding Station, abreast of Wooster's distillery, to be visited by the Port Physician.

Vessels arriving here from any port with sickness on board, must stop at the above station until

visited by the Port Physician, and in neither case to have any communication with the shore without his permission.

By order of the Board of Commissioners of Navigation and Pilotage.

Wilmington, N. C. June 14, 1856.

The Deviation in Ship's Compasses.

IMPORTANT TO SHIP-OWNERS AND CAPTAINS.

THE following important communication on the subject of the accumulation of small compass errors in wooden ships, has been addressed by Mr. W. W. Rundell, the Secretary of the Liverpool Compass Committee, to Thomas Court, Esq., the Secretary of the Liverpool Underwriters' Association. The importance of the subject to the shipping trade of the United Kingdom can hardly be over-estimated—a fact fully borne out by the continuance of the grant of £100 by the Board of Trade in aid of the researches of the Committee. The indefatigable exertions of their Secretary, Mr. Rundell, call for a passing comment, and we have no hesitation in stating that to his tact and ability is owing, in a great measure, the success which has hitherto attended the labors of the Compass Committee.

LIVERPOOL COMPASS COMMITTEE,
40 Tower Buildings, East, May 15th, 1856.

THOMAS COURT, *Esq., Secretary to the Underwriters' Associaton, Liverpool:*

Dear Sir—Some months since I ventured to call your attention to the fact, that while the "variation" in the Irish Channel, between Wales and Ireland, was slightly less than two and a quarter points of the compass, the general practice with shipmasters and pilots was to allow two and a half points. I find, by inquiry, that in many cases this allowance is still made, and, in some instances, even so much as two points and three-quarters. It will be easy to show that though on some courses such an allowance for compass error may be quite correct, it is most unsafe to attribute so much to "variation," and allow it on every course.

That the remarks I am about to make in elucidation of this and some associated topics may be generally intelligible, allow me to explain that though some persons use the terms "variation of the compass" and "deviation of the compass" as if they were of the same meaning, the well-informed seaman makes a great distinction between the two, and for the following reasons: the error from variation arises from the magnetic North not coinciding with the true North; and, as this affects every point of the compass to the same extent, the allowance for it, whatever be the direction of the ship's head, is always the same at the same place and time. It is quite independent of the position of the ship. Not so with deviation, which is caused by iron on board the ship, and which varies in amount with her position, but in so regular and simple a manner that its changes may easily be understood. On which ever side of the compass the disturbing cause is situated, it will be seen that, as the ship turns round, the compass and it alter their relative bearings. Let it be supposed that the disturbing piece or pieces of iron are towards the stern, aft of the compass, then, when the ship's head is North, the disturbing cause will be South; when her head is East, the iron will be West; and so on thoughout the whole circuit—taking in succession every possible horizontal direction. Now, though we may conceive the disturbing cause to exercise the same energy in each of these directions, it does not act with the same leverage, with the same mechanical advantage in each, and, therefore, does not produce the same effect on the compass needle. When its attraction is in the same direction as the needle, or when it is North or South of the compass card, no deflection of the needle is produced. When it acts at right angles to the observed direction of the needle, it causes the greatest deflection or deviation. The general effect of iron aft and below the compass, the case we are contemplating, is this: when the ship's head bears North, there is no error; as it turns Easterly, the iron aft turns Westerly, and (in North latitute) attracting the North end of the needle, causes Westerly deviation, producing its greatest effect when the ship's head bears East. The deviation then decreases slowly at first, afterwards more and more rapidly, till her head is South, when again there is no error. The ship still turning round to the Westward, the disturbing iron is carried Eastward, and draws the North end of the needle to the East, now producing Easterly deviation; arriving at its greatest when the ship's head shows West, and again decreasing until she regains her original position.

In few words, we see that iron aft and below the level of the compass produces Westerly deviation; that is, takes a vessel to the left of her course, when he head is Easterly; and produces Easterly deviation, causing a vessel to tend to the right of her course when her head is Westerly. To state the result yet more briefly, its effect is always to take the ship to the North of her course, and to the greatest extent when her head bears due East or West. A walk round our docks will show that many ships have a considerable amount of iron in the position we have supposed. Without venturing at present to estimate the amount of its action, I merely ask you to remember that, with the ship's head Westerly, its tendency, like too large an allowance for variation, is to take a vessel to the right of her course.

But it will also be seen by any one who visits our shipping, that nine out of ten ships have long,

and more or less massive horizontal iron spindles connected with the steering apparatus; in some cases at a higher, and in some at a lower level, than the compass card; and I proceed to ask your attention to the action of such bars upon the compass. Now, these bars, in fact, the fore and aft horizontal portion of all the iron in the ship, produces an effect which has beeen aptly termed "quadrantal," (for the reason that it changes its character in each quadrant of the compass,) and produces Easterly deviation when the ship's head is between N. and E.; Westerly deviation when E. and S.; Easterly deviation again when the ship's head is between S. and W., and again Westerly in the remaining quadrant. It is worthy of remark that this deviation is independent of locality, and has the same effect at the equator as at the pole.

As before, I will not attempt to estimate the amount of this kind of error, but only direct your attention to the fact, that in two quadrants of the compass it will tend to decrease, and in the other two to aggravate those deviations which arise from iron situated aft and below the compass.

There is another cause of error which must be mentioned here, though it does not affect so large a number of ships as the preceding. I allude to the double binnacle. In many cases where these are used the compasses are placed so close as to disturb each other, and the result is a quadrantal error of precisely the opposite kind to that arising from fore and aft iron; but, like it, alternately increasing and decreasing the errors due to that cause of deviation which was first discussed.

These remarks convey but a very imperfect idea of the compass question—they should be taken in the restricted sense in which they are given, and as illustrating the possible accumulation of small errors; but I would protest against their being received as merely theoretical, for they are the result of ample and practical experience. My desire is to briefly state as much as may enable any one who will give the subject a little attention, to understand the nature of the deviations likely to arise from the iron fittings about the rudder and steering apparatus, on board wooden ships. When deviations occur in our merchant ships, which do not arise from iron cargo, the cause is almost invariably found in this direction, and the errors are, consequently, of the opposite kind to those observed in men-of-war. (This should be borne in mind by persons reading works which have been published on compass deviations, in which the observations have been mostly derived from officers of the royal navy.)

The recent loss of a noble vessel, happily without the horrors which usually attend the wreck of an emigrant ship, will, no doubt, give some interest to the discussion of those compass errors which are usual on board wooden ships. I hope the few remarks I have made may be sufficient to enable most persons to rightly estimate any facts bearing on this subject which may be ascertained, in relation to the ship in question, and that they may induce those seamen who have not yet fully considered the matter, to give it the attention its importance demands.

I am aware of the contempt the seaman has for small compass errors, and the general belief that no course can be depended on within "a quarter of a point or so." This belief is a good reason why the greatest accuracy should, at the least, be attempted. True, small errors frequently compensate each other; but when this is not the case—when they all fall in the same direction—(as must, unfortunately, be the case sometimes, and nowhere with worse results than in the Irish channel)—when to a quarter point of Easterly deviation, arising from a wrong allowance for variation, and another quarter point or more of Easterly deviation, from iron aft and below the compass is added a trifle of Easterly deviation, from the spindle of the steering wheel being within eighteen inches or so of the compass card, these small deviations may not be safely neglected. In fact, a full acquaintance with those compass errors, which are probable, or even possible, cannot be too perfectly acquired by those whose business is upon the sea. Certain it is that casualties often occur to ships while steering courses on which these small errors accumulate; and we not unfrequently hear of cases in which a fatal catastrophe was imminent, and only averted by the merest accident—a timely look-out, the appearance of a light in an unusual direction, a change of wind, or the opportune break of day.

My letter has extend to greater length than I anticipated, but I trust the subject and its occasion will be sufficient excuse.

Believe me, dear sir,

Your most obedient servant,

W. W. Rundell,

Secretary Liverpool Compass Committee,

Fog Signal at Buffalo Harbor, New-York.—A bell of 1500 pounds has been attached to the Lighthouse at the entrance to the harbor of Buffalo, N.Y., which, during the continuance of fog, will be struck a blow by machinery every 10 seconds.

Buffalo, N.Y., May 1, 1856.

A statement having been made by a witness at the investigation held at Liverpool, in the matter of the ship Mermaid, relative to the depth of water at the bar of the port of Pernambuco, which appeared to Mr. Cowper, H. M. Consul there, to be injurious to the interests of the port, as giving an incorrect view of its capabilities for the accommodation of shipping, the following report has been obtained from the Chief Pilot there, and is published for the information of mariners:

PERNAMBUCO, March 12, 1855.

Most Illustrious Sir—In reply to the questions which your lordship put to me yesterday, it is my duty to inform you:

1st. That at spring tides the bar at the port of this city has 20 feet of water, and the small bar from 16 to 17 ft., over which vessels drawing from 14 to 15 ft. of water can enter; those drawing as much as 17 can do so no higher up than Poco.

2d. That as vessels come from the Moaqueira in going out, and have to pass the inner bar, near the lighthouse, they can do so only drawing 14 to 15 feet, with a favorable wind.

3d. Lastly—The great bar of which I first spoke, being in a line with the Recipe, is open to the swell; that within the harbor, which is the greater impediment, is in smooth water. I may add, although the question was not put to me by your lordship, that in those anchorages called the Lameras and Samenhoes, vessels of any draught of water can load and unload with facility.

God preserve your lordship.

JOSE FAUSTINO POSTO, *Chief Pilot.*

The Most Illustrious H. Auguta Cowper, Consul of England.

A new illuminating apparatus has been substituted for the old light in the lighthouse at the mouth of Grand River, Mich., and will be exhibited hereafter from sunset to sunrise, until the close of navigation.

The light will be produced by an apparatus of the fourth order, of the system of Fresnel, showing a steady light, with a bright flash at intervals of three minutes.

Notice is hereby given that the following buoys have been replaced in Buzzard's Bay, entrance to New-Bedford harbor:

Mashaum Ledge, 2d class Nun, black No. 1. Wilke's Ledge, 1st class Can, red and black horizontal stripes.

Also the following in Vineyard Sound:

Horse Shoe Shoal, 2nd class Nun, black No. 5.

Tuckernuck Shoal, East end, 2d class Nun, red No. 12.

Boston, May 19, 1856.

SHOAL—HONG-KONG HARBOR, FEB. 28, 1856.—A shoal was seen by me in the Catharine Apcar, on the 22d January, in the Dampier Straits, with bearings as follows: Pigeon Island, W., a little S.; Fowl Island, S.S.E.; Mansfield Island, E. by S. ½ S.; Button Island (a small island to the eastward of King William's Island), N. ¾ E.; Augusta Island, just open to the Northward of Pigeon's Island.

The shoal is nearly even with the water's edge east and west about ½ of a mile; and think this must be the one the Sophia Fraser struck upon, as there is no shoal E. by N. 6 miles from Pigeon's Island on a line with the water's edge.

R. FOWLER, *Master of the Catharine Apear.*

DEEPENING OF THE RIVER ORNE, FRANCE.—A notice to mariners has been published by M. Lepeuple, Engineer-in-Chief to the harbors of Calvados, and certified by Mr. P. Barrow, the English Vice-Consul at Caen, to the effect that, from the works which have been executed in the new bed of the Orne, there is now in the channel of the new cut as great a depth of water as formerly existed in the part of the old river which has been replaced.

NOTICE TO NAVIGATORS ON THE WESTERN COAST OF THE UNITED STATES.—Copy of a letter from the Superintendent to the Secretary of the Treasury, with a copy of communication from Capt. W. L. Dall, P. M. S. S., "Columbia," and extracts from a letter of Capt. Jas. Watkins, P. M. S. S., "Golden Age," relative to facilities for navigation afforded by the development of a deposite of reddish sand detected by Commander Alden, United States Navy, inside of the bar at the entrance to San Francisco harbor, California:

COAST SURVEY OFFICE, May 7, 1856.

SIR:—I have the honor to subjoin herewith a copy of a letter addressed by Capt. W. L. Dall, of the Pacific Mail steamship, Columbia, to Commander J. Alden, United States Navy, assistant in the Coast Survey, in relation to the development made by the last named officer of a deposite of sand peculiar to the inside of the bar at the entrance to the harbor of San Francisco, and which was made the general subject of my communication to the department under date October 20, 1855.

In addressing Commander Alden, Capt. Dall says:

"After completing the survey of the entrance to the harbor of San Francisco, you were kind enough to show me your chart, and point out to me the characteristic soundings; you called my attention particularly to the fact that as soon as the bar was crossed, the lead would bring up gray sand with red specs, and that such bottom was found at no place outside the bar.

" Since then I have had, on two occasions, an opportunity to use the information acquired from your chart.

"In October of the last year, coming from the Columbia river, I made Point Arena, (95 miles from the Heads) and at the same time met a dense fog. I ran by time and the revolutions of the wheels until I was up with Point Reyes, when the course was altered for the Heads. To be certain of my position, I got a cast of the lead every fifteen minutes. In four hours after passing Point Rayes, I found myself in five fathoms, which I supposed to be on the North bank, forming part of the bar off San Francisco harbor. Steering E. S. E., and sounding carefully, the water soon deepened to ten fathoms, when I had the lead armed, and it brought up grey sand with red specs. I was certain, (relying on your chart) that I was inside the bar and off the entrance of the harbor. I kept the same course until we got eighteen fathoms, when I hauled up N. E. by E., and in a short time got the soundings under the North shore, then altered the course to E. by N., which took me in clear of Fort Point, and the first thing I saw through the fog was the long wharf on North Beach.

" On my last trip from Oregon, I made Point Reyes at midnight, and saw the light on Point Boneta at intervals. At 2 A. M., when about ten miles from the Heads, the fog shut down so dense that we could not see a ship's length. I continued on until by the soundings we were on the North bank, and in four and a half fathoms. I then dropped a kedge and waited for daylight. At 5 A. M., got under way, steering E. S. E.; and sounding, we soon got eight fathoms, and the lead being armed, brought up gray sand with red specs. When in fifteen fathoms, I changed the course E. by N., and soon, by the deep water, supposed I was in mid-channel. When the fog lifted, we were ruuning fairly up the channel, and midway between Fort Point and North shore. Had I not been guided by what I had learned from your chart, I should, in both instances, have had to remain at anchor outside until the fog lifted.

" Three years ago I was off the harbor in this steamer three days in a dense fog. Had the soundings and peculiarities of the bottom been as well known then as now, I should have been able to run in by the lead. The chart of the entrance of the harbor of San Francisco will be an invaluable assistance to the captains of steamers running on this coast, saving much time during the foggy season, and enabling them with proper caution to enter the harbor at times when without it they would be obliged to wait outside for clear weather."

Capt. J. Watkins, of the Pacific Mail Company's steamship Golden Age, in transmitting to me a copy of the communication just quoted, remarks, in regard to the facilities for navigation to be afforded by the publication of the development referred to by Capt. Dall:

" A short time prior to my leaving San Francisco, I crossed the bar on board the United States steamer Active, and I was highly gratified to know that the bar chart, when published, will furnish us a safe guide into the harbor in thick weather with our lead. As the soundings are so marked and accurate, there can be no mistaking them, in my opinion with proper attention to the lead."

I would respectfully request authority to publish this communication in the usual form, for the benefit of navigators on the Western coast of the United States.

Very respectfully yours,

A. D. BACHE, *Superintendant.*

Hon. JAMES GUTHRIE, *Secretary of the Treasury.*

THE CAPE ROMAIN LIGHT.—The following petition is left at our office for signatures, and commends itself at once to all whose experience and interests have made them conversant with the necessities of shipping frequenting our port, or passing near it.

The substantial facts which recommend the prayer of the petition, are so well stated therein that we may at present leave it to speak for itself.

To the President and Members of the Light-house Board:

The petition of the undersigned, masters, owners, and merchants residing in the State of South Carolina, and commanders of steamers plying out of the port of Charleston, respectfully showeth:

That the dangerous shoals which extend off from the vicinity of Cape Romain, and known as Cape Romain Shoals, which lie immediately in the track of vessels bound into the port of Charleston, and near which all vessels from Europe and Northern ports of the Atlantic, must pass, is but imperfectly marked, rendering them dangerous in the entrance in thick weather, the land being very low, and in consequence of a mist which generally prevails in the vicinity of the Cape, obscuring the light at night and the tower of the lighthouse by day.

This being the case, your petitioners would respectfully suggest the propriety of having a lightship, of the first class, immediately off the outer shoal of said Cape. This being effected, your petitioners are satisfied that much property would be saved, which is now annually lost upon the shoals named, and render secure the passage of this Cape, upon which more vessels have been stranded than upon any other shoal upon our coast.

The iron can-buoy marking the Black Ledge to New-London harbor, Ct., has been removed for repairs. A spar-buoy, painted red, and numbered 2, has been put in its place.

A spar-buoy, painted with red and black horizontal stripes, has been placed to mark the west end of the Sea Flower Reef, west entrance to Fisher's Island Sound, New-York, and will be kept there until the beacon is lighted.

New-York, March 29, 1856.

Fenwick's Island Shoal.—The bell-buoy boat has been replaced off the N. E. part of this shoal, and lies in 8½ fathoms water.

Fenwick's Island bears W. by S. (by compass.)

Crest of the shoal, (with 15 feet water,) bears S. W., distant ½ mile.

A west course from the boat crosses the north part of the shoal in 4 fathoms water.

Philadelphia, May 26, 1856.

Las Rochas Rocks, (Brazils.)—From a report by Lieutenant Parish, of her Majesty's steamer Sharpshooter, forwarded by her Majesty's Consul at Pernambucco, it appears that those rocks, which are of coral formation, are situated in lat. 3 deg. 51 min. 25 sec S, and long. 33 deg. 46 min. 23 sec. W. of Greenwich; variation of compass, 8 deg. W., when visited in the month of March last.

The shoalest water is on the east side. Masters of vessels are strongly urged to anchor until daylight, when in their vicinity. The rocks bear, by compass, as follows:

Breakers south extreme, S. 15 deg. E.

Middle of sandbank, S. 27 deg. E.

Highest rock of the group, S. 42 deg. E.

Breakers extreme, S. 50 deg. E.

The highest part of the bank is about 10 feet above high water mark, with a rise and fall in the tides of 7 feet.

Lieut. Parish states that there are many wrecks of vessels on different parts of the bank, and he observed two casks of water out of reach of the tide, with some bales of cotton. As the place abound with birds, which are easily caught, and the ground is covered with their eggs, a ship's company, he remarks, could easily exist on the group for a lengthened period. He planted some cocoanuts, to form, in time, landmarks.

Chicago Harbor.—Col. Graham has just issued a new map of the harbor. It is accompanied by the following sailing directions:

For vessels drawing over 8 feet, and not more than 12 feet water: Bring the Liberty Pole at the intersection of Michigan avenue and Washington street, or the steeple of the Second Presbyterian church, to bear due west by compass, and run on that course until the beacon light on the end of the north pier bears north by west, then keep on this course by steering for the beacon light, until the mouth of the river between the piers bears anywhere between W. N. W. and W. ¼ N., and run on said course.

Vessels not drawing more than 8 feet may avoid running down so far south, and enter as follows: Bring the flag-staff or dome of the Lake House Hotel to bear W. by N. ¼ N. in a northerly wind (to make allowance for leeway) or W. by N. ½ N. with a leading wind, and run on said course by steering for the said object, until the beacon light on the north pier bears N. by W., then run in for the mouth of the river as per preceding paragraph; or the tall chimney of McCormick's Reaper Factory may be brought to bear W. by N. ½ N., and run on that course for said chimney until the beacon light on the north pier bears N. by W. Then run in for the mouth of the river as above.—*Chicago Press*, 22*d*.

Fog Signal.—We inspected, in company with several insurance agents and masters of vessels, the air alarm whistle of Keith & Foster, to be used on sail vessels in foggy weather. The whistle is precisely similar to the whistle of a locomotive, and the sound is produced by a jet of air instead of steam. The air is condensed in an air chest, by a lever; twelve strokes will fill it in half a minute, and then the whistle may be sounded until the air is exhausted. A system of signals is proposed to be used by this whistle on vessels by long and short sounds, as follows:

General Alarm, - - -		What is your course, - - - -
North, ·	North East, ·——	East, - -
South East, · · ——	South, ——	South West, ——·
West, —— ——	North West, —— ——·	In Distress, - - - - - - -
	Call for a Pilot, ——- - -	

The contrivance will attract general attention among vessel owners, for there can be no doubt that the safety of vessels in fogs could be greatly promoted by the general use of the air whistle.

To Ship-Owners, Ship-Masters, &c.—The Board of Wardens of the port of New-Orleans have issued the following circular, to which we call the attention of Merchants, Underwriters, Ship-Masters, and Auctioneers :—

Office of the Masters and Wardens of the Port of New-Orleans.

To Merchants, Underwriters, Ship-Masters, and Auctioneers :

We beg leave to call your attention to an act of the Legislature of the State of Louisiana, approved March 15, 1855, from which you will perceive that the Master and Wardens of this port are the only persons authorized by law to survey cargo and damaged goods brought into this port; also the only persons authorized to order a sale of damaged goods.

Further, that they, with the aid of a competent carpenter, are made the surveyors of damaged vessels, or any vessel deemed unfit to proceed to sea.

We are also required to keep a record of all our surveys, which is at all times open to the public, and at the same time perpetuating the testimony to be used by any party interested.

As some persons have been in the habit of performing the duties which solely belong to this Board, and in order to give credence to their certificate, use the title of Marine Surveyors, (a name unknown to our laws,) thereby inducing the public at a distance to believe that they are really officers known to the law, we deem it right and proper to inform you that their eertificate is no more than that of any other citizen. We state this fact that all parties interested may be enabled to protect their rights.

The undersigned, Masters and Wardens of this Port, appointed by the Governor of the State, and duly commissioned and sworn as such, will devote their personal attention to the duties of the office, and hope, from the fact of their having no connection with any interest that conflicts with the duties of the office to give at least impartial decisions.

Very respectfully yours,

Geo. W. McCerren, *Master Warden.*

S. F. Frost,
J. G. Landry,
D. Michell, } *Wardens.*

N. B.—Masters of vessels are particularly requested not to break the stowage of any damaged goods until surveyed, as no certificate can be given for the same unless the stowage is seen.

ABSTRACT OF SHIP-BUILDING IN BOSTON, JUNE, 1856.

Mr. James O. Curtis—Three ships : one a medium clipper, 190 × 39 × 24, the other a cotton ship 130 × 35 × 23.

Mr. S. Lapham—One ship, by the day, in the most thorough manner.

Mr. Foster has lately sold a new ship of the old stamp.

Mr. Magoun is building a small bark by an old model, said to be good for coasting trade.

Mr. Jotham Stetson—A ship for sale, said to be fair model, rigged and on the stocks.

Mr. Paul Curtis—two ships : one for E. Bangs, and about ready to launch, designed for carrying, and good profile ; another, 180 × 38 × 24.

Mr. John Taylor is building a three-decked ship from model of Shakspeare, 200 × 41 × 28.6.

Mr. D. McKay has just launched a bark for the Mediterranean trade, designed to be fast ; also ship Lady Gifford, unsold, and is building another on sale.

Mr. R. E. Jackson is about commencing three or four single-decked barks for southern trade.

Messrs. G. & T. Boyle have just finished ship Plutarch, can be seen in New-York, 190 × 38 × 24, owned by Mr. Howland, Liverpool line ; another ship in frame.

Mr. D. Kelly is building a cotton ship, *new model*, 160 × 37 × 23, *only two* others having been built by it, the Dragoon and the Conquest.

Messrs. E. & H. O. Briggs have just launched the ship Joseph Peabody, same model as the Alarm ; just commenced a new ship, 190 × 39 × 24, full.

H. McKay has a ship on the stocks for sale, full model.

Messrs. Holden and Ghallager are buildng an Iron yacht propeller, 210 × 36 × 21, for Mr. G. Stone, contractor for the Viceroy of Egypt.

SALES OF VESSELS.

Steamer Gilpin, 100 tons, built in 1851, for $2,800 cash.
Ship Bowditch, 578 tons, 17 years old, for $10,000.
Ship St. Peter, built in Bath, Me., 5 years old, 425 tons, for $14,500.
One-sixteenth of Ship Wm. Wirt, of New Bedford, at auction, June 14, for $775.
One-sixteenth of Ship Hydaspe, at New Bedford, at auction, May 26th, at the rate of $6,950.
Ship Elizabeth Ellen, 510 tons, 8 years old, at auction, in Baltimore, June 11th, for $15,000.
Ship Caravan, 330 tons, at auction, for $4,050.
Ship British Empire, at Liverpool, at auction, for £16,000.
Barque Chili, of New Bedford, 294 tons, for $6000.
Barque Maryland, 200 tons, at auction, for $6,900 cash.
Mary Ann, 215 tons, at auction, June 5th, for $10,000.
Louisa Eaton, 295 tons, built in 1848, at auction, for $4,500.
Comet, 547 tons, 4 years old, at San Francisco, for $18,000 cash.
One-eighth Barque United States, at New Bedford, at the rate of $4,200, May 26th.
Vittorioso, (Sard.) at NewYork, for $1,050 cash.
Orlando, built at Newburyport, new, 269 tons, for $14,000.
Brig Elvira, of Boston, for $3000.
Annawan, 161 tons, at auction, in Boston, June 7th, for $1,550 cash.
Helen Monroe, at auction, in N. Y. June 19th, for $2,750.
Schooner ———, 100 tons, built in New Haven, 10 years old, for $2,500.
Palmyra, of Nantucket, 100 tons, for $2 800.
Rosilla, 53 tons, at auction, in Boston, June 9th, $610 cash.
Fred. Lawrence, 78 tons, 3 years old, at auction, in Boston, June 5th, for $2,400.
Ship Sea Lion, 573 tons, at auction, at St. George's, Bermuda, June 6th, for £660.

LAUNCHES.

At Brunswick, Me., May 12th, ship Consignment, of 1160 tons.
At Chelsea, May 19th, ship Sumatra, of 1000 tons.
At Brewer, Me., May 20th, brig Susan T. Norcross, of about 285 tons.
At St. Roch's, Br. Pr. May 22nd, barque Matilda, of 491 tons, O. M.
At Hare Point, Br. Pr., ship Louisiana, of 1400 tons.
At Boston, May 26th, ship Plutarch, of 1200 tons.
At Freeport, Me., May 23d, barque Oasis, of about 650 tons.
At Portsmouth, May 27th, ship ———, of 1100 tons.
At Essex, Conn., May 16th, brig Ida D. Rogers, of 250 tons.
At Damariscotta, May 20th, by Messrs. A. Stetson & Co., ship Abner Stetson.
At Belfast, Me., by Messrs. White & Conner, ship Madocawando, of 1100 tons.
At East Machias, Me., May 31st, schooner Crusoe, of 150 tons.
At Quincy Point, Mass., May 24th, barque Quincy, of 350 tons.
At Georgetown, Me., ship Helen E. Booker, of 900 tons.
At Newcastle, Me., May 19th, ship ———, of 1300 tons.
At Rockland, Me., by Messrs. Hill & Lawrence, June 5th, ship Julia Lawrence, of 873 tons.
At Mattapoiset, Mass., by J Holmes, Jr. & Bro., June 2nd, bark Sunbeam, of 360 tons.
At Newcastle, Del., by G. Deaknye, Esq., June 4th, bark———, of 520 tons.
At Boston, June 7th, by Messrs. E. & H. O. Briggs, ship Joseph Peabody, of 1200 tons.
At Richmond, Me., June 7th, by Thos. Spear, Esq., ship——— of 1050 tons.
At Staten Island, June 5th, by Mr. Townsend, schooner Light Foot, about 700 tons.
At Bath, June 7th, barge Zeno, of 527 tons.
At Essex, Conn., June 9th, tern schooner Kate Stamler, of 600 tons.
At E. Boston, June 10th, by D. McKay, Esq., barque Henry Hill, of 550 tons.
At Fairhaven, Conn., schooner Nelly Baker, of———tons.
At Warren, June 14th, barque Xanthe, of 320 tons.
At " June 15th, barque Henry, of 450 tons.
At Essex, Conn., June 11th, by A. Boyd, Esq., schooner ———of 80 tons.
At " June 15, by A. Burham, Esq., 2 schooners of 80 tons each.
At " June 16th, by J. Story, Esq., schooner———, of 75 tons.
At Baltimore, June 18th, ship John Clark, of 1100 tons.
At New-York, by Messrs. Rosevelt, Joyce & Co., Barkentine Fairy, of———tons.
At Newcastle, Del., June 16th, barque Early Bird, of 520 tons.
At Brunswick, Me., June ———, by R. Pennell, Jr., ship Majestic, of 714 tons.
At Phippsburg, Me., June———, by Messrs. Drummond & Minot, ship Armorial, of 530 tons
At Buffalo, by D. O'Conner, Esq., schooner Charmer, of 250 tons.
At Dover, C. W. June ———, schooner Louise Powell, of 244 tons.
At New-York, June 25th, by Messrs. Rosevelt, Joyce & Co., brig Horace Beals, of 360 tons.
At Kennebunk, Me., June 21st, by Messrs. Emmons & Littlefield, ship Celia, of 575 tons.

NAVAL REFORM.

It is with regret that we find ourselves differing so materially with a highly esteemed correspondent, as to be under the necessity of wholly rejecting "An act repealing an act, entitled "An act to promote the Efficiency of the Navy," acted upon and approved on 28th February, 1855." Our first opinion of the "Act to promote the Efficiency of the Navy," has withstood the fiery trial of discussion to which it has been submitted, without the shadow of a change. We have never ceased to consider the law a *good* one—not perfect, in the nature of things that could not be, but at least as good as any ever proposed—embracing both the wants of the country and the Navy. The very reason that the Navy was so long in gaining any reform whatever, is—the same that would now operate in undoing the good that has been effected—because every officer has his bill to offer, every one some special claim, every one some special point to make. Hence it is not to be wondered at, that so many were finally swamped in what each contributed to propel.

Repeal the act referred to now, and there would be the same deluge of propositions and petitions as have infested the Navy for the last ten years, and no one of them would be a whit less objectionable, nor in the result affect a smaller number of individuals, than that about which there has been by far too much hue and cry, by persons who care nothing about the Navy, whether it be good or bad, but they do care about some poor Tom Dick or Harry, who has been caught in the trap which he himself contributed to set. It is justly believed, that at the time that act was proposed in Congress, that more than nine-tenths of the officers in the Navy were in favor of it, and were willing to take their individual chances for any ill effects on them, for the common good of the whole.

That it was never contemplated to disgrace the worthy, was co-equal with its scope, in not allowing the Navy to be any longer disgraced by the unworthy; and it has only become a bad law in being abominably carried out. The public appreciation of this fact is unmistakably shown in the circumstance that several of the furloughed and dropped officers now command and officer some of the finest American clippers which grace the ocean, in every part of the world, showing alike their eminent nautical qualifications and their high character as merchants and gentlemen.

If the Board had used proper discrimination in retiring officers who were disqualified for service by disabilities incurred in the line of duty, from those who were incapacitated by their own bad conduct, none of the odiousness of the Reserve List which has been made to appear, would be at all apparent.

That it has been made to appear odious in the minds of many, has not

arisen from any defect in the law itself, but from the classification and want of proper discrimination on the part of the Board. To any one well acquainted with the Navy both before and since the operation of this law, it would be the height of absurdity to say that it has not been the means of a most salutary improvement—an alacrity for duty which the service has never before known in time of peace. Many months ago we went over the whole ground, and since then our shoots have been plucked by vapid newspaper editors and other enthusiastic landsmen, who have tried to twist and distort them into a different conclusion from what we then arrived at, and still entertain, that

"Neither the President nor Secretary could withhold approval from the report of the Board, *as a whole;* for it disposed legally and finally of a number of officers *notoriously incompetent*, but it is known to all that they did not agree with it in very many *individual cases*. And it is believed they will apply the remedy—so far as the executive can apply it—by *re-nominations to the Senate*."

Such was our language before the meeting of the present Congress, and such is our belief still. Good is apparent—give the full benefit of it, and correct the evil. It is by no means too late to do this, nor has the Naval Committee nor the Hon. Secretary shown any disinclination to give every reasonable privilege and opportunity for removing the injustice.

An Amendatory Bill by the Hon. Chairman of the Naval Committee, contemplates a correction of this error by authorizing the President, with the advice and consent of the Senate, to transfer any officer from the furlough to the reserved pay list, &c. This would correct one evil at least, and surely the same power is competent to correct others. Of some other indiscriminations, it is in the power of individuals themselves, both on the active and reserve lists, to correct. The prominent vice, intemperance, which above all others called for naval reform, has not, it is well known, both in and out of the Navy, been judiciously acted upon. And while we would have brought this crime before a different tribunal—a legally constituted court-martial—instead of the Naval Board, we do not think that the findings would have been less nor the punishment more undeserved; and it is in the power, *and it should be made the duty* of the officers on the active list of the Navy, to fully carry out Naval law on this crime; and it is equally in their power, and it should be the privilege of those who have been wrongfully dropped or retired under this law, *for acts outlawed by time*, to show that they have been unjustly dealt by, and such should be reinstated.

One section of our valued correspondent's proposition we most heartily concur in, and we have it comprehended in a paper which we are preparing under a different head—"That of the number of Midshipmen who may be found qualified for promotion at any final examination, no greater

number shall be retained in the Naval service than may be necessary to fill the vacancies then existing in the grades of Master and Lieutenant, and all others of the Passed Midshipmen shall be forthwith dropped, and their connection with the naval service of the United States discontinued." With this there would be no just cause of complaint. Let them be received at the Naval Academy in numbers amply large to satisfy all the requirements of the Government, and on graduating receive diplomas as graduates of the Naval Academy, continuing in the service only those who may be required to fill the vacancies, and a remedy will be found to prevent another superabundant accumulation of a grade of officers which never should have existed.

Passed Assistant Surgeons should be done away with too. And this could be done by applying the Act to Promote the Efficiency of the Navy to the Medical Corps, by which those who are from any cause incapacitated for duty, would not stand in the way of promotion of those who now have to do it without the pay, and by promoting them whenever they have passed. The number of Surgeons now capable of performing all their duty both ashore and afloat, together with all the Passed Assistant Surgeons, would be less than the number of Commanders now on the Active Service List, and the requirements of the service for a Commander, without a Surgeon, are less than those for a Surgeon without a Commander. To every ship, yard and rendezvous they are equal. If in superintending certain works, a Surgeon is not necessary, equally numerous at least, are the Hospital and other stations for Surgeons where no Commander is necessary. The difference in pay of the Passed Assistant Surgeon and the Surgeon of first five years after date of commission, is less than $150 a year, and as Surgeon, of more than that amount less than his messmates—lieutenants—who, since the establishment of the Reserve List, are most of them his juniors in both age and service. Naval Reform only *commenced* with the Act of February, 1855. Every friend to it should use his efforts to keep it in progress.

OUR STATE ROOM.

BROOKLYN.—*Death.*—Lieut. Thomas C. Eaton, æt. 32, June 1.

THE MARINE BARRACKS.—It is a subject of thankfulness to every Marine Officer and private in the Navy, who has ever been so unfortunate as to be quartered in the dilapidated old building called "The Barracks," on this station, that the government lease for these grounds expires in Nov. next.

But the meanness of the government, in having so long held a lease on this worse than worthless property, for the protection of those who have specially devoted themselves to the service of the country, has just manifested itself in a new feature. There has been a Board of Engineers lately

appointed, by Commodore Smith, of Washington, consisting of Captain Sanger, Mr. Brown, Chief Engineer of Norfolk Navy Yard, and Mr. Murphy, to select a site and make estimates for new barracks; and never was the poverty of owning poor land more palpably displayed, than what it is in the $220,000 worth of mud and abomination conducted by the Brooklyn sewers in Uncle Sam's investment in Wallabout Bay. Some speculating politicians, a few years ago, induced the government to buy about fifty acres of low-water mud-flat, extending from the Navy Yard to the Naval Hospital. Had the tide been left free access to this flat, the Brooklyn sewerage and carrion here emptied and deposited would have continued to be swept away every high water.

But dykes and other obstacles have been erected into landmarks, with the effect of forming a hot-bed of putrefaction, in which flourish the noisome seeds of disease, unfit to be compared to anything short of a Portuguese jail in a tropical climate, where deserters are sent under sentence of death at the end of—no matter how many—days, for the prison executes them.

This Board, after careful examination, instead of reporting that the said premises were unfit for service, and should therefore be thrown into the East River, where they belong, report that, some 18 feet deep—for foundations in the Navy Yard, piles have to be driven thirty-five feet deep—this mud and city offal lies on a hard and substantial bottom, which would furnish a good foundation to seven acres, by placing on it 30,000 cubic yards of rubble stone, and 150,000 cubic yards of earth. The said stone will cost about 50c. per yard, and the earth 25 cents—equal to $55,000, to build a foundation! And this estimate includes no loss for the washings of tide, and other contingencies in doing *government* work for a period of five years—which it would take to prepare the ground only, before the buildings could be begun. That it would, in all probability, cost three times that amount, few will question who critically survey all the uncertainties. But, suppose it all complete, at whatever cost—one seventh of this bed of corruption covered by barracks and parade ground, surrounded on three sides by the remainder!—can any one conceive that such a place would be tenantable? It is a notorious fact, that a vessel being near the Wallabout filth, will have all her white paint blackened by the sulphureted hydrogen which escapes from it in one night; and had the Board sent on here to examine it worn bright buttons to their coats, they could not have spent 15 minutes on these grounds without noticing the corrosion. The only reasonable use for this bay flat is that of water front to the city which borders it. By the city it would be judiciously appropriated to a proper use, and cease to be a nuisance to the Navy Yard, as it now is; and the government could, in exchange for other property, or by sale of this to the city of Brooklyn, procure ground now in the market, free from all the objections here but faintly represented, and at once proceed to the erection of barracks.

Six acres of land on the south side of Flushing Avenue, we are assured,

could be purchased at an amount of but little, if any, exceeding what it would cost to lay a doubtful foundation on a place which would in the end be untenantable.

The *Niagara* has received from the contractors for her machinery, Messrs. Pease & Murphy, her four boilers and three engines, and had them all fastened in their places. She has now about 5[illegible]0 tons of her machinery on board; and she will probably be complete in about two months.

The receiving-ship *North-Carolina* is kept in apple-pie order; she has, all told, about 300 men on board, two-thirds of whom are recruits. Lieut. J. P. Decatur has been re-ordered to her.

The several buildings which have been for the last three years in process of erection, have now so nearly approached completion, as to display their utility.

The shed for gun-carriages, which is one hundred and fifty feet by sixty, and built entirely of corrugated iron, is about ready to receive the floors. It was built by contract by Marshal Lefferts, and cost $15,000.

The smithery, which is three hundred feet by sixty, with two win[illegible]h two hundred feet by sixty, is built entirely of brick and iron; the roof of corrugated iron. The men are now engaged in laying the flues. There are eight hundred feet of smoke-flue, fifty-four inches in diameter, placed under ground, which are to convey the smoke from all the forges in the main building and wings, to a chimney outside of the building, and midway between them. The smoke is forced or sucked from the forges, none of which will have chimneys, into the flues, and conducted in them underground to the central chimney, which will be one hundred and twenty-nine feet high, sixteen feet in circumference at the bottom, and seven feet at the top. There are also eight hundred feet of blast pipe, eighteen inches in diameter, running alongside of the smoke-flue.

The boiler shop, for making boilers, two hundred feet by sixty, built of brick and iron, with slate roof, was commenced last fall, and is now ready to receive the roof.

The oakum shop, which is sixty feet by thirty, sides and roof of corrugated iron, is nearly finished, and cost about $13,000. The oakum has now to be sent to New-York to be manufactured, but this will be done at the yard as soon as the building is completed.

The armory, a brick building with iron roof, two hundred feet by sixty, is ready for the partitions between the departments.

The carpenter's shop, which is two hundred feet by seventy, built of brick, with slate roof, is nearly finished. It is ready for putting down the floors, and is estimated to cost $50,000.

Stone is being cut to build a quay along the outer part of the Upper Navy Yard; both as a breakwater and to aid in draining it.

The greatest difficulty in building at the Navy Yard, is to lay a founda-

tion; they have to drive piles thirty-five feet deep, and overlay with concrete all the foundations.

The *Supply* arrived here on the 28th of May. She has been paid off, and all the officers, except her Commander, Lieut. D. D. Porter, detached. She arrived in a fine condition, as clean and as sweet as a nut, and will shortly be refitted for another load of camels. We understand that an agent will precede the *Supply*, this time, to purchase the camels, and have them collected together at some convenient place of exportation, to prevent the detention experienced in her first cruise. The camels were transported in a fine healthy condition. They were transferred to a steamer at Balize, (she was not towed up the Mississippi as at first intimated.) She transferred more than she started with, though one old one and two young ones died on the way. An immense stone shot, such as are projected from mortars, on the Bosphorus, was brought home by the Supply, and is curious for its perfect workmanship and extraordinary size.

The steamer Dispatch, from Key West on the 6th ult., arrived on the 12th with invalids from the Home Squadron.

Norfolk.—The successful launch of the *Colorado*, on the 19th ult., is the news of the month. Good order was preserved; no accident happened; nobody hurt; and she went off finely amid the salute from the Pennsylvania, and the huzzas of about 6,000 spectators.

Every possible precaution was taken to prevent accident to the steamer in launching. The ways were laid on piles extending out 40 feet from the wharf; large floats were secured to the stern; and she was provided with large anchors that were dropped when she reached the channel of the river.

Her dimensions are the same as those of the Roanoke, being more than 200 tons larger than the Pennsylvania. The hull will be taken under the shears, and the boilers immediately put in.

Philadelphia.—The Wabash is nearly ready for her crew, and will soon proceed on a trial trip.

The Steam Frigate Saranac, from a cruise in the Mediterranean Squadron, arrived on the 25th ult.

Washington.—The steamer Minnesota will leave soon for Philadelphia, to receive her rigging and armament.

Annapolis.—The following is a list of Midshipmen, of the date of 1850, who have recently passed their final examination: John G. Walker, John G. Mitchell, Francis M. Ramsay, Charles F. Peck, Richard W. Meade, Jr., A. C. Izard, Marshal C. Campbell, Robert Boyd, Jr., Calvin F. Thomas, Charles C. Carpenter, A. J. McCartney, W. A. Kirkland, Wm. H. Dana, Edward E. Potter, George Bacon, J. Crossan Chaplin, L. A. Beardslee, Wm. L. Bradford, Charles A. Babcock, Æneas Armstrong.

Class of 1849.—George Brown and C. E. Hawley, after Passed Midshipman H. A. Adams; R. L. May, after Passed Midshipman W. H. Ward; J. W. Shirk and George F. Morrison, after Passed Midshipman H. Garland.

COAST SURVEY.—The *Arctic*, now at Brooklyn Navy Yard, has been ordered to make soundings for the N. Y., Newfoundland and London Telegraph Company, between Newfoundland and Valencia Bay on the Irish Coast. *Officers.*—Lieut. Commanding, O. H. Berryman; Lieut. J. G. Strain, Master J. G. Mitchell. Passed Midshipman, C. F. Thomas. Midshipman, J. S. Barnes.

THE *Merrimac*, on her trial trip from Norfolk, arrived at Havana on the 2d ult., 24 days out. On the 4th day after leaving Norfolk she broke her propeller, and made the rest of the way under sail. On the 5th ult. she was towed into Key West by four boats, rudder unhung, and out of order, steering with her sails. The *Fulton* was dispatched to Havana for machinery for her, and at last accounts, she is reported nearly ready for sea. It is to be hoped that she will not be ordered on a transatlantic trial trip until she shall have made a more successful one on short distances, unless accompanied by the *Savannah*, or some other relief ship proved capable of crossing the ocean.

AFRICAN SQUADRON.—The U. S. ship *Jamestown*, bearing the broad pennant of Commodore Crabb, was at Porto Praya on the 16th April. The *St. Louis* had just arrived from a cruise down the coast. The brig *Dolphin* had returned from the Canaries, and was preparing for a cruise on the coast. The *Jamestown* and *St. Louis* were to sail in a few days for a cruise to windward to recruit, and will probably be in Madeira in June next. The health of the officers and crew of the squadron is very good.

BRAZIL SQUADRON.—The United States store ship *Relief*, Lieut. Commanding J. W. Cook, with stores for the squadron, sailed from Rio Janeiro previous to 18th April for Montevideo, to meet the United States frigate *Savannah*.

The *Savannah* is reported to have had near two hundred cases of yellow fever (?) on board, but all had recovered except one, Mr. Edward Murray, son of Purser Murray, attached to the *Savannah*. The *Savannah* is soon to return to the United States.

EAST INDIES.—The United States steam frigate *San Jacinto*, Commodore Armstrong, arrived at Singapore on the 5th of April, from Penang, having on board the Hon. Townsend Harris, Minister Extraordinary to Siam and Japan. The *Macedonian*, Captain Pope, having on board the remains of the late Commodore Joel Abbot, sailed next day for Boston; and the sloop of war *Vandalia*, Commander Roots, was ordered to proceed for Portsmouth, N. H.

NEW BOOKS.

Moseley's Mechanics of Engineering. First American from second London Edition. With Appendix, by D. H. Mahan, LL. D. Wiley & Halsted, New-York.

This is a work of merit, containing 700 pages, octavo. It is divided into six parts, viz. :— Statics, Dynamics, the Theory of Machines, the Theory of the Stability of Structures, the Strength of Materials, and Impact The Editorial Appendix contains a variety of important truths, with one error, copied from the Transactions of the Royal Society for 1850—note C., on the Rolling of Ships. The proper distinction is not made between theoretical and practical stability in the rolling of ships.

Haswell's Mechanics' Tables is a small volume prepared at the suggestion of a want of the kind of information of which it treats by engineers themselves.

It is a work for ready reference, and furnishes information upon the cutting of boiler plates, covering of solids, with weights of various metals, and miscellaneous notes, comprising dimensions of materials, alloys, paints, lackers, &c. It is within the requirements of convenience of reference and economy of cost, and well adapted to the class for whom intended — mechanics and engineers. Can be had of Harper & Brother, New-York.

ICONOGRAPHIC CATALOGUE OF THE U. S. NAVAL LYCEUM, AT THE NAVY-YARD, BROOKLYN, N. Y.

NATURAL HISTORY.

Part II.

SECTION III.—LIFE.

(Continued.)

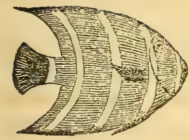


Fig. 30*

THERE are four agents remarkably active and constant in their destruction, and recomposition of even the hardest rocks—air, water, heat, and chemical action; and there are but two conservative principles, vegetation and cohesion. Air and water act both chemically and mechanically, and as they frequently contain carbonic acid, which, together with their own constituents, they produce such compounds as have little or no cohesion, or are readily dissolved in water; and wherever water is found it is blended with mineral substances, some of which it holds in chemical, and some in mechanical solution.

Volcanoes, earthquakes, and thermal springs are due to heat, though the cause of it cannot always be clearly demonstrated.

The *destruction* and recomposition thus briefly alluded to, constitutes the basis of a new formation which, by the action of water and carbonic acid, that of themselves, supply oxygen, hydrogen, and carbon in the condition best suited for combination, produces a new compound calculated to give sustenance to vegetation. This new process of action is developed under precisely those circumstances best calculated to continue it, as it of itself now contributes to an increased elaboration of the very conditions which first gave it existence, by its own self-multiplication—a living, growing, reproducing cell. A new and *different* arrangement only, of natural causes, produces substances totally different, in both structure and properties, from the materials employed, though they are so closely allied to them in chemical composition, that their differences cannot be detected. Notwithstanding the great diversity in the structure and properties of the tissues of both plants and animals, they both take their origin from the same organizable material, and in all cases the newly formed matter is continuous with that previously existing. New matter is constantly and completely incorporated with the old. It is in this manner that germs are produced with all the properties inherent to them to manifest themselves when set free from their parent cell; and this it is which distinguishes the living being. In the highest animal, as in the humblest plant, life consists in the preparation of a germ-cell, which has the power of development into a structure similar to that from which it sprang,

*CHÆTODON—*Striatus.*—There are several varieties of this beautiful little fish; they mostly abound in hot climates, frequent rocky shores, and are edible. There are four or five specimens in the Lyceum.

by a new arrangement only of the particles which constitute the elements of formation and produce LIFE.

The heterogeneousness of this collection necessarily precludes such a classification and description as will do more than furnish a few samples of specimens as illustrative of the province of the Society—to form such an unexampled LYCEUM, in its strictest sense, as will honor alike the science of Natural History and the noble profession here linked with it.

In glancing over these cases it should be constantly borne in mind that the specimens here presented from every part of the world, both sea and land, were collected as mementoes in relief of the toils of monotonous cruising, rather than to form specimens in cabinets of Natural History; therefore the incongruity that would offend the naturalist who makes study and system his business, here, rather adds to the interest of the collection. The wonders of the deep are side by side with the trifles of the shore—and when we reflect on the motives which for the time bore down the burthens connected with this *omnium gatherum*, however incongruous, we can but participate in the emotions of pleasure which has here constituted one class only, based on one origin.

THE VEGETABLE KINGDOM.

The *vegetable world* is co-extensive with the globe, and in the ocean lives the very beginnings of life. The simplicity in the organization and the imperfect development of water-plants, renders them but little attractive to the observer of Nature's grandest displays; hence it is not to be wondered at that *sea weeds* cut but a small figure in the world-wide gleanings of the mariner. A few only of *Algæ*, *Lichens* and *Fungi*, either from fancied or real peculiarities, are scattered here and there in the cabinet cases, and need more care.

Firns.—There is a considerable collection of, mostly from the Island of Jamaica, and some of them are beautiful specimens, but they are going to pieces for want of proper preservation.

Flowering Plants.—Eighteen classes (Linnæus), composed of two hundred and seventy-three specimens well preserved, from Lower Canada, are worthy of prominent exhibition.

THE ANIMAL KINGDOM.

Molusca.—Shell-fish. The simplicity of *animal* life in the sea is still more remarkable than the vegetable, while the specimens which exemplify it have such attractions as to render them sought after and preserved in almost the reverse order from what is attractive (perfection) in the plant. The class of *Polyps* possesses the remarkable peculiarity of restoring lost parts, and in proportion as they subdivide they multiply—every section being so constituted as to be capable of a perfect production. They are

but a single step above the vegetable, and *bud* themselves into existence. Life and death progress in them at the same time and proceed together—they produce and grow at the summit, while the base dies and forms a substantial and increasing foundation for the continually progressing new structure. The only limit to their growth is the surface of the water, on reaching which they die from exposure—their race is run. Humble ministers of Creative Power, they build islands, form reefs, extend coasts, close harbors, and environ seas!

Some species, when living and expanded in the sea, are frequently ornamented with bright colors, and resemble magnificent carnations or bunches of lilac just dropped into the water; hence they were formerly considered vegetable productions, and gained the name of *Sea-Anemones.*

Some are fleshy throughout; others secrete lime and form tubes. Many of them secrete a peculiar horny substance at their base, which accumulates in proportion with the growth upward, so as to give increased support and strength for a wide spreading top: such is the *Gorgonia* or *Sea-Fan*, of which there are several specimens in the Lyceum.

Coral is the product of the dead and dying polyp, and every succeeding death adds to its growth. It extends by forming a calcareous net-work for the living animal's support, and it is between the tissues and minute ramification of the animals that the coral is deposited and moulded into shape.

Scattered through the several cases in the Lyceum, there is a very pretty collection of corals, but none more worthy of notice than the *Alcyonia*, (Fig. 27), chiefly remarkable for its regular shape and great size, a *zoophite*, essentially a sponge in its organization and habits, and yet a coral producing polyp.

Coral polyps differ materially in their geographical range and distribution; those having the greatest, are produced in the deepest water—100 to 200 fathoms. The *reef-coral* is produced at a depth of only about 20 fathoms.

Were it in the province of our catalogue, we might here dwell upon the harmonious orgasm and instinct of the simplest forms of animation; describe their manners and customs, so to speak, and thus render their study attractive, for other reasons than the superficial aspect of their work *Conchology*, one of the largest and most beautiful collections in the Lyceum, consisting of about 1,000 specimens, many of which are rare and beautiful, now being classified and arranged by the members—could, under this head, be appropriately dwelt upon. The rough tenement of the oyster could be traced from its first layer, as each succeeding one is added by the handy mantle of the occupant, as his increased size requires a more commodious and substantial dwelling-place. The splendid cots, constructed on such principles, for strength far surpass all human architecture, and are perfectly adapted to their wants; and the equipment and cruising of the nautilus, or the nest

and eggs of the matron *snail*, are but a beginning of the innumerable inducements continually multiplying with the progress of the naturalist.

A number of *chitons* and star-fish, some of which are of extraordinary size, constitute the best specimens of the *molusca* in the Lyceum.

PISCES—*Fishes.*—Those selected for the cuts are more out of regard to their state of preservation best admitting of it, than to any prominent peculiarities, as more worthy of illustration than many other far more rare specimens.

The exceedingly brilliant *Trichiurus Argentus*, the *Balistes*, a tropical fish which becomes poisonous at certain seasons, on account of its food; several *Fistularia*, or trumpet-fish, remarkable for their very long heads, about one-third their whole length, and a number of *Flying-Fish* and *Porcupine* fish, are but a few of the best specimens, more interesting to look at, as well as to study the habits of, than those here illustrated.

There are, also, a number of skeletons, and parts of skeletons, of the most voracious fishes, such as shark's jaws, the saws and swords of *saw-fish* and *sword-fish*, &c., &c.

HERPETOLOGY.—*Reptiles*—Judging from the smallness of the collection, seem to have been as little attractive to the members of the Lyceum, as they are to most persons.

The Chelonia—Turtles and Terrapins—are, by a few of their remains, supposed to have interested their collectors in another field of view.

Saurians are represented by several interesting specimens, among which are—Alligators; a Gecko, a species of Lizard, so called in Egypt on account of its peculiar cry; Iguanas, a Dragon, and several Cameleons.

Batrachians.—Of these, besides a number of the most common native species, several Salamanders, both land and aquatic, in a fine state of preservation, are, on account of their singular faculties of endurance, most worthy of study. The Syren is also represented.

Ophidia.—The serpents are mostly of native species. One large Rattle-snake, a variety of Colubers and Water-snakes—in all about a dozen specimens.

ENTOMOLOGY.

Fig. 31.*

Arachnides.—One of the most remarkable specimens under this head is that selected for illustration. The Tarantula is confined to the hottest portions of Asia and America, and their habits are little known.

Scorpions.—There are several of these from Asia, Africa, and America. They are found in the tropics of both hemispheres, but usually in the coolest places. They live on the ground, concealed under stones or amidst ruins, and not unfrequently smuggle themselves into houses, where they are never welcome. They are quick-footed, and easily frightened, but always ready for a fight on being cornered. They usually run with the tail well up, or curved over the back, ready for either attack or defence, while with their forceps, they seize their food or show their scorpionship to such smaller insects as they may deem unworthy of a more deadly instrument. They are particularly fond of spiders' eggs, which they always pierce with their sting, as they do all their other food, before partaking.

The wound caused by the sting of the scorpion is frequently of but little consequence, though sometimes very dangerous, and, consequently, should always be regarded with attention. There are three species, and the difference in the severity of the wound has been regarded by some, as owing to its being inflicted by a poisonous or non-poisonous species. The greater probability is, that it depends more on the age of the scorpion; wounds from large (old) ones being far more poisonous.

As in every family of this class of animals, the scorpion takes remarkable care of its young. The mother carries them on her back, wherever she goes, for several weeks, never leaves them for a single moment, and will perish ere she will release them. When strong enough to attach themselves, she watches them with the greatest assiduity, and is always ready to stand to the death between them and an enemy, and they require more or less of her protection for the long period of two years, before they are capable of continuing their species.

* *Tarantula.*

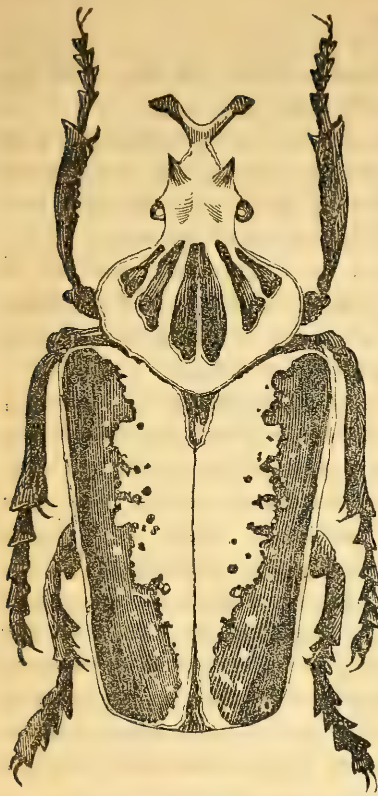


Fig. 32.*

Insecta.—Caleoptera—of all insects not only, but of all animals, these (*Beetles*) are most numerous. Their peculiar formation, exceeding brilliancy and beauty, have always claimed for them alike the attention of the philosopher and the observer of the beautiful. Their coat of mail has been the object of study for all generations, and the complete metamorphosis which they undergo has equally attracted the physiologist.

The maternal solicitude of the Insecta, is scarcely less remarkable than that of the Arachnides. They always deposit their eggs with reference to their preservation, and under such circumstances as to secure a supply of food so soon as the larvæ make their appearance; and if, by their unforeseen instincts, these conditions do not continue, the mother collects food for them. But, the most remarkable instinct of all is displayed in their selection for the distribution of provisions. The communities and societies of insects are not unlike those of other animals; particular individuals are qualified for certain pursuits, and the whole community is best off, in proportion as each individual attends to his own business. The *mules* and *laborers* among ants, bees, termes, wasps, &c., are brought up to their specific livelihood. They are apprenticed at an early age by their mothers in their distribution of food, and if other qualities are to be developed, she carefully distributes other, or withholds a portion of the daily ration, till the proper disposition is fully manifest.

It was formerly supposed that the working bees, ants, &c., were *neutrals*, that is, neither males nor females; but it is now pretty well understood that they are *female* domestics, apprenticed at an early age, and so well trained and educated, by both diet and discipline, as to be contented with their lot, though not without such endowments as, if early improved, are capable of being developed into perfect *antships*, &c.

The *Goliath Beetle*, from Africa, which we have selected for illustrating his class, it is to be supposed, was in no wise stinted during his youth; and it is reasonable to conclude that, if he was not king of all the beetles in his

*Goliath Beetle.

neighborhood, he was, at least, of *queenly* proportions. It is the largest species known, and one of the largest of the species to which it belongs. They have been found in Africa, East Indies, and Tropical America.

There is a case containing about 500 insects from Brazil, some of which are of the rarest specimens, but *other* insects are feeding upon them, and unless they are speedily cleansed and repaired, they will be a total loss.

There is scarcely a cabinet case in the Lyceum that does not contain an insect either dried or preserved in liquor.

Myriopoda, commonly called *Centipedes*, constitute several of the best preserved specimens, and they can here be seen in all their remarkable peculiarities of the *order* not possessed of life.

Those here preserved, are strictly *centipedes*—some of them more than hundred footed—though Myriopoda includes a larger number, comprising such only as have more than *six* feet. They in general are not very unlike little serpents—their feet being so short and delicate as not to be readily perceptible, though on close examination they are perceived to extend the whole length of the animal, the furthest forward of which being attached to the jaws, and on that account called buccal feet. There is a difference of opinion among naturalists regarding the true classification of these animals; some placing them among the Arachnides, and the other among the Insecta. They seem to participate in their organization of both—and even approach the Crustacea, and may therefore be regarded as a sort of transition genera, pertaining to either one or the other, according to the predominating development of such parts as mostly characterize others. They undergo a metamorphosis, and in that respect at least—as well as the form and direction of the *Tracheae*—they mostly pertain to Insecta.

The body of the young Centipede is of reniform shape, perfectly smooth, and wholly destitute of feet or other appendages. The segments of the body and the feet develope themselves with increase of age, and they are not fully developed until two years old. But they never use all of their feet for locomotion, and their number is not strictly indicated by the name they bear. They undergo numerous metamorphoses. After the first, they have eighteen pairs of feet, and these only they use in locomotion. After the second, they have thirty-six, and after the third, forty-six pairs of feet, and thirty segments. Finally, at full growth, the male has thirty-nine, and the female *sixty-four pairs* of feet, when they undergo another and last metamorphosis, and then only are they capable of perpetuating their species. Notwithstanding their great number of feet, they are *creeping* things, and move slowly. They are usually found in hot climates, damp, dark places, rolled up into spiral forms.

Fig. 33.

Figure 33.* *Aves.*—Birds are so strongly characterized as to be in all cases distinguishable from every other class of animals, while their general similarity in shape and organization, renders their classification proportionately difficult. Their characteristic beauty, great industry, skill, and exceeding care for the preservation of their species, have at all times rendered them prominent as objects of observation and study to the traveller and the naturalist. But by far the most remarkable *faculty*, not only of birds,—but of all animals not admitted to possess *mind*,—is their prescience of atmospheric changes; a peculiarity never lost sight of by the meteorologist of any age, and which before meteorology became a science, more strongly impressed superstition on the ancients than all the other instincts of animals put together. To the sailor this instinct of birds always tells which way the wind blows—or is going to blow—and he remembers and regards it with no less veneration than he does all the mishaps of unlucky Friday.

There are in the collection about two hundred specimens, many of them of the same species. It is to be regretted that while the importance of the habits of birds, *sea*-birds especially, is acknowledged in noting meteorological changes, more attention has not been given to this branch of natural history by members of the Lyceum. The selection for illustration is one of the latest acquisitions, and is well represented by the drawing, its only colors being black and white. It is about the size of a pigeon, and in summer plumage. It was procured by the Kane Expedition. There is another, *Alca Artica*, differing from this only in being rather larger, and having a different bill. These birds are never found outside of very cold climates. They belong to the same class as *Penguins*, several of which are in the Lyceum, and were all formerly called by that name by the Dutch on account of their excessive fatness. They have small wings, and are poor flyers. The *Puffin*, of a nearly allied family, is here represented in magnificent proportions. *Diomedea*, the *Albatross*, the largest of all sea-birds, is here to be seen in his best proportions. It is worthy of note, that this bird indicates by a single name, its place of first discovery, the island of Deomedes, near Tarentium; and the *ancient Diomedes* who received the Greeks favorably into their possessions, but on a given *war-whoop* ferociously attacked the barbarians, were no other persons than the Deomed here represented. He is about six times as large as a goose, and was doubtless, at particular seasons, six times as valiant in defence of his countrymen.

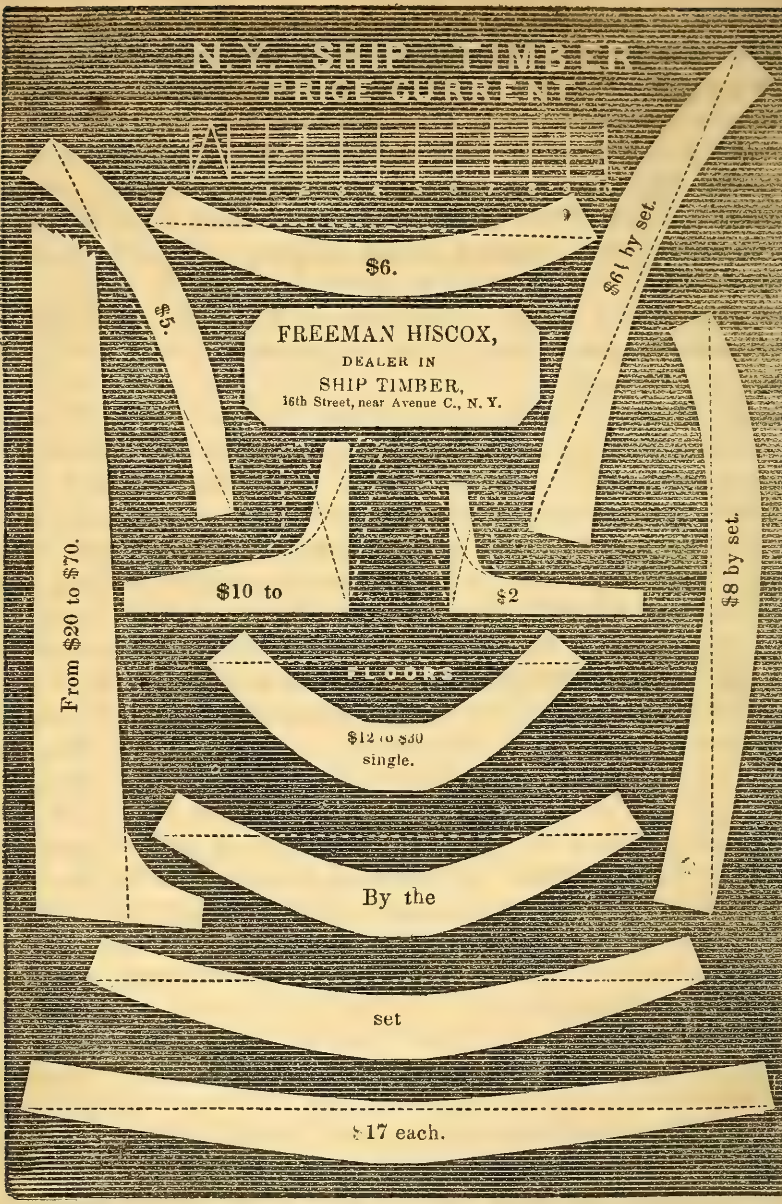
Attractive for their exceeding beauty, there are several specimens of the *Birds of Paradise* in full plumage, and with them several others of scarcely

* Alca, torda. Auk, from the Arctic regions.

less pleasing appearance from the same regions—New Guinea. There are two cases of beautiful Australian specimens, and among them an *Ibis*, believed to be of the same species—*Ibis religiosa*—which was adored in the temples of ancient Egypt. We have under another head, Antiquities, referred to the specimens embalmed among the collection of the sacred objects of the Egyptians. It is believed by many that the cause of the adoration of this bird by the Egyptians was owing to its habit of devouring serpents. Whether so or not, it is well known to be a great enemy to them. But one other assignable cause, of equal weight at least, is of much interest to moderns, and well known to be a harbinger of good to Egypt, its appearance just previous to the overflow of the Nile. An anticipation dependent upon atmospheric change, doubtless, and so delicate as to be beyond our remotest conception.

Vulture.—The great Condor of the Andes, no less remarkable for the height at which he flies than his great size as compared with all other birds, here stands with a *Pelican*, whose pouch would hold half a bushel, not up to his knees; and the warrior Albatross, in the same case with him, would need a sling equal to David's to combat with such a Goliah; they are said to be great cowards, however, and always hold themselves aloof till sure of no resistance. A *Vampire* bat, two feet from tip to tip of its wings, from Africa, a large *Spoonbill*, belonging to the same family as Cranes, a specimen of the largest species of *Rail*, and several beautiful specimens of the *American Ibis*, in brilliant colors, are but a few of this beautiful collection of birds.

Quadrupeds are but just represented by a good specimen of a *Black Monkey*, who seems to keep guard over two or three *Armadillos*, which, with their strong shields, would be as non-concerned for his presence if all were alive, as are their almost life-like aspect in which they are here preserved. A large American *Ant-Eater*, the Lamanoir, is represented by his skin in another case, and a number of beautifully polished horns, tusks, &c, &c.—among which a crown from a California Elk, the main branches of which are more than five feet long—constitute the *finale* of our glance at Natural History in the Lyceum.



A set floors and futtocks, $9 each Oak Flitch, 30 cents per cubic foot ; oak plank, $36⅔ to $40 per M ; deck plank, $35 per M. ; hackmatack timber, 25 cents per cubic foot ; chestnut, ditto ; cedar, 30 to 50 cents : yellow pine timber, rough, 35 to 45 cents per cubit foot ; ditto, sawed, $28 to $30 ; yellow pine plank $27 to $30 per M.

Oak Knees—5 inch $2 50 ; 6 inches, $5 ; 7 inches, $7 ; 8 inches, $10 ; 9 inches, $12 ; 10 inches, $15 ; above, $1 50 per inch.

Hackmatack Knees—5 inches, $1.50 ; 6 inches, $2 50 ; 7 inches, $4 25 ; 8 inches, $6 00 ; 9 inches, $8 ; 10 inches, $9 00 ; above, $1 per inch.

Yellow metal, 25 cents, at 6 months ; copper sheet, 28½ cents, ditto ; copper bolts, 31 cents, ditto ; composition nails, 19 cents, ditto.

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THE DANGERS OF THE SHIP.

How astounding must be this announcement to those accustomed to that well-known *lullaby*, (*the dangers of the sea*), against which they have been so long accustomed to seek their only security in insurance policies. How surprising that, in the middle of the nineteenth century, there should be just cause for such a caption as stands at the head of this article; and yet it is no less strange than true, that *the dangers of the ship are more to be dreaded by underwriters themselves*, *as well as by seamen and passengers*, *than the dangers of the sea.* The waste of wealth, as exhibited by a return of the losses of insurers for the past six months, is sufficient in itself to arouse the dormant energies of every man in whose heart glows the warmth of benevolence, in whose bosom vibrates a thrill of humanization, or in whose composition there is to be found one drop of the milk of human kindness, seeing that these losses are but the index to that of human life. Language may lend its descriptive powers to tell the portentous tale of a ship having been torn piecemeal upon a sea-girt coast; numbers may not fail to express the underwriters' loss; but where shall we find a potency of power so dominant in the council chambers of human sympathy, as to elucidate the consequent entailment of human wo? Who can distil into language the faintest description of a wreck of human hopes? Who can depict the imprisoned sorrows of widowed mothers, the sufferings of helpless infancy, consequent upon the loss of a single ship? And yet, by the returns of the Board of Underwriters, near sixteen millions of dollars, loss within the orbit of the past six months furnish but the index to an entailment of grief, sorrow, and misery, for which no adequate expression may be had.

The pen and pencil may combine and tax the elements of literature and science to draw from an admiring and appreciating public involuntary outbursts of admiration for the sublime and the beautiful, while the philan-

thropist may weep and wonder at the untold, squalid misery, consequent to some extent upon the chilling indifference manifested at the lurid glare of mental anguish, but in a far greater degree upon a mistaken commercial economy in the waning half of the nineteenth century. Could human sorrows be liquified by the power of the press, and furnish food for the sensibilities of an enlightened age, what pictures of human suffering would that power express, and how strange would the ignorance and apathy of civilization and science appear, when contrasting the dangers of the "ship with those of the sea." The world has so long been accustomed to *the silvery tones of science in ship-building*, that nothing short of an exposure of those ridiculous absurdities, which palsy the best exertions of man in every art, will serve the purposes of interest and utility, much less of humanity. But why should there be such a repugnance to investigation in the philosophy of ships, seeing that the world is so deeply and universally interested in their quality, is a question which the reader may ask; and before we proceed to show what ships are, and what they should be, it would be well to answer, and settle any doubt that may exist upon this subject. From time immemorial there have been two classes of investigators into the art and mysteries of ship-building—the one class the theorist, the other the practitioner; the former sought to acquire a knowledge of cause and effect from theory alone, without a basis for their hypothesis, the other claiming that practical knowledge furnished the only key to this mysterious art. These opposite conclusions served as a barrier to keep the representatives of these two classes (the head and hands) apart; and while the man of science claimed all for the demonstration, the man of practice held all science as theorems yet to be proved by practice. The former held that mathematical demonstrations furnished the most reliable data; the latter insisted that perfected science could only be obtained through the channels of practical knowledge. Unfortunately, the interests of the two classes of investigators were not only dissimilar, but diametrically opposite the one to the other. But alas for the practical investigator! he was held in obeisance to kingly power. While the theorist was fostered by the influence and wealth of governments, the man of practical knowledge was confined to the fruits of commerce, based on utility and adaptation for success. But had these been the only opposing interests, the world might long since have formed a union between the mind that conceived and the hand that executed. The belligerent demonstrations of the Old World for the last 3,500 years have caused all the genius of literature and science to bow in submission at the footstool of kingly power, and furnish their boldest thoughts and best exertions, toward the advancement and improvement of fighting vessels, from whence originated the term Naval; and while military architecture pertained to fortifications upon land, naval architecture belonged to those floating demonstrations of war on the sea; and whatever was worth knowing in this department must be dedicated to His

Majesty's navy, and obtain the royal sanction, before it could be published, as though the ocean were made for no other purpose than that of displaying the belligerent forces of kingly power, or man's only end, the destruction of his race. Hence we find, that in all the history of the past, Naval is the only term applied to Maritime Architecture, even down to the present time; and records will show that we have been the first to distinguish, apply and adopt the title of Marine Architecture to commercial vessels, in contradistinction to Naval, and show their superior qualifications, notwithstanding the disadvantage at which merchant vessels have been built. With these facts before us, it is no marvel that at the present time ship-building should not yet have been reduced to a science, and that the list of disasters should be long and fearful in its consequences, both upon life and wealth; that the "dangers of the ship should, in very many cases, exceed those of the sea." If history tells truly, it is more than 2,600 years since the first double-decked ship was built; and we venture the assertion, that the crew of this vessel had less to fear, by way of disaster, than one-third, at least, of the double-decked vessels built at the present time, whether designed for maritime or naval purposes. In any and every other department of human industry, science has been so far perfected, as to enable practitioners to apply the light afforded by nature's laws; but upon the subject of marine art, all appears dark and mysterious—an unwritten chapter in constructive science, which all are alike entitled to read from the pages of their own fancy;—a subject upon which there are no orthodox theorems of light and knowledge not *possessed and exhibited by the unlettered savage when constructing his canoe of bark*—not confined to age, sex or condition. Such was the *hiatus* in nautical literature, down to the middle of the nineteenth century, when the philosophy of ship-building began to be made known, without the consent of royalty, through the medium of types, in the Western world. But alas for the superstitions and prejudices! The knowledge of mankind can never be commensurate with its experience. The rapid growth of American commerce has been met with a corresponding loss, consequent upon what has hastily been set down to the account of the "Dangers of the Sea," when, in fact, nearly one-half of the loss may be justly attributed to the dangers of the ship.

When we remember that a ship of 500 tons, possessing a given amount of strength, within a given capacity, possesses but one-eighth of the capacity of another of 4,000 tons, and has a greater amount of intrinsic strength in any and every part to carry her burden than the larger vessel, have we not just reason, as monitors of a press devoted to Nautical Mechanism, to warn the commercial world against the "dangers" of the ship as now *constructed, as now proportioned, as now surveyed, and as now insured?* While we may know that the larger vessel is most profitable for transatlantic voyages, we may also know that the same appliances are not sufficient to render them safe conveyances either for passengers or freight, as is abundantly proved

by experience the present year. While the capacity of a vessel is increased in the ratio of 8 to 1 by doubling her principal dimensions, (the model retaining the same type,) the strength of the larger vessel, with the same size of materials, would be but one-eighth of that of the smaller vessel; and if the dimensions in detail were increased in like proportion, the strength could not be, by any possible means, by the same mode of proportion and distribution of the materials; and for the following reason, the materials are combined in a series of lengths, which, together, make up the length of the vessel; and at all these connections we have weak places in the fabric.—Now, it must be quite apparent to the most obtuse mind, that as the size of the materials are increased, the weaker parts follow in the same proportion; and if a ship of 100 feet length requires plank above water of 4 inches thick by 5 inches wide, we have at the end or butt of every length of plank an area of $4 \times 5 =$ to 20 inches of butt surface in which there is no strength. Now, if the length of the ship be doubled to 200 feet, and the planking be doubled to $8 \times 10 =$ to 80 inches of area of butt, have we not 80 inches area of butt in which there is no strength to the vessel? But we may be told that these ends may be scarphed. Well, and what then? the strength is somewhat increased we admit, but much less than is very generally supposed. This glaring discrepancy in the constructive art, let it be remembered, is found in daily practice, uninfluenced by the theorists of hoary years, or by the mandates of kingly power; it is found in a department where it is claimed that experience was the grand palladium of success; it is found where perfected science is claimed by virtue of extended practice. This, however, is but one of the many departments in the constructive art in which the most glaring mistakes are but too plainly manifest. We shall notice another, and then allow the reader to draw his own conclusions, after pointing to an antidote which, but for the strongest prejudices against innovations, would have commended itself to the common sense of every shipowner and Board of Underwriters in the United States long ere this. Since the induction of large vessels for freighting purposes, it has been the practice to furnish additional strength by strapping or plating the frames diagonally in opposite directions, on the inside of the vessel, bolting the plates to every timber and to each other. This was rendered necessary to keep the plates to their places by bringing the strain upon the heads of the bolts, thus doing by circuition that which might have been done much better by the more direct application. The means first adopted, and still in use, is for the plates to hold the bolts *by the head*, while the bolts hold the timber of the frame, and the frame and fastening is required to hold the plank; now, however ridiculous this may appear, it is not only the mode adopted to strengthen large vessels, but finds advocates among shipbuilders, not because there is the least particle of the philosophy of common sense in it, but because they so learned of others. Who does not see that if the plates had been placed on the outside of the frame, that they would have

done the work, which must now be transferred to, and done by the bolts, and the plates would be much stronger than they now are, being without holes in their weakest part, which is at the middle of their bend, or in the bilge, where the greatest amount of strain is felt along the line of their length? Who does not see that if the plates were on the outside instead of the inside, that they would only require to be fastened at the ends? *What would we think of a cooper who should hoop his cask on the inside, and then, in order to keep the staves to their places, should bolt them to the hoops;* and yet, in the construction of vessels, we do that which is less mechanical. Where is there an example in mechanism which exhibits an equal amount of strength and capacity, with the same proportionate amount of weight and bulk of materials, as the cask? And is not this what *ship-owners, builders, freighters, travellers and insurers require in vesssls to insure profit and security?* It undoubtedly is. We have not the space in a single article to do more than show a very few of the most glaring discrepancies in the present mode of building vessels of the larger size. It must be quite clear to an ordinary mind that if the strapping had been on the outside of the frame, instead of the inside, though it had been but in one direction, and had the planking been in *two thicknesses instead of one*, and the strapping in the opposite direction been placed on the first thickness of planking, that the vessel thus constructed would have been much stronger with less material, and consequently much more reliable than at present built. It is to us not a matter of surprise that wooden vessels have been deemed less reliable than iron *by dealers in iron.* Were they built as they should be, there is no just reason why they should not continue to have the preference that has thus far been awarded them. But in order that we may show that practical knowledge has not alone been at fault in the philosophy of Nautical Construction, we shall devote a few lines to an analysis of form, as having much to do in determining the safety of transatlantic as well as coasting navigation. Security is scarcely less dependent on the form of ships than upon the distribution of the materials in the fabric. A heterogeneous form may be instrumental in rending into fragments the best arrangement of materials in the hour of trial; the first great cause of disaster to many an otherwise noble ship may be traceable directly to her form. But who is at fault? The theorist has defined an elementary basis of navigable form, and this form has been carefully guarded by laws of admeasurement, both being placed under the fostering care and development of government patronage and naval development. In how many thousand instances the ship has been sailed with the wrong end foremost, with the spars and sails tending to carry the vessel in one direction, while the model has absolutely and positively repudiated the course, we dare not even venture to guess; but this we will do—we will tell the Board of Underwriters, as well as all others interested in vessels, that at least one-fourth of their losses is owing to this cause. Not a small per centage of the disasters are consequent upon the

bowsprit being in the wrong end of the vessel, or being of disproportioned length, and not adapted to the requirements of the model. Who will dare say that three-quarters of all the vessels built are not masted and sparred in other respects without the least reference to the model beyond that which might be guessed at by the eye, which has so long been familiarized with error, that it never would recognize right, though it were placed within the range of its vision, *and yet this is called science.* If guessing be a science, then that is true which the world assumes, and those people called North Americans, have been abundantly successful in their peculiar prerogative, as their list of vessels and amount of losses abundantly prove—the losses being equal to about thirty millions of dollars annually, which, we hesitate not to say, would not be exceeded in ratio were the United States at war with a foreign power, when the combative powers of man would be combined with the elements of nature for the destruction of this hand-maid of civilization.

Under such circumstances of hostility, would we not be more particular in our selection of shapes, more mechanical in our mode of constructing the hull, and distributing the propulsory power, more considerate in our computation of tonnage, and, as a consequence, more successful in preventing disaster to life and property? We submit the chances to any man who is himself versed in the science of marine construction and of probabilities, whether it were not a more profitable investment to insure a vessel built (upon scientific principles, wherein the mind that conceived, the hand that executed the construction, were found in the same person,) well adapted to our coasting trade, to pursue her vocation in time of war, than to insure against the dangers of the sea only, in time of peace, under the present system of modelling and construction. For our own part, we would prefer taking our own risk, with the right kind of vessel, in time of war, to accepting half insurance with the present type of vessel in time of peace. Unless the models of vessels are adapted to the service required, and the distribution of sail adapted to the model in a greater degree than they have been, *the dangers of the ship will continue to be greater than the dangers of the sea.* Who that is at all conversant with the philosophy of constructive art, cannot discover that by the selection of form and the distribution of the materials for elementary strength, the present type of vessels furnish the greatest amount of strength where the least amount of service is required, and that the ends of the vessel are stronger than the more burdensome middle; that the greatest proportionate weight of vessel is found where there is the least bouyancy to sustain it, and that the consequence of this malconstruction is charged to the dangers of the sea, instead of being charged to the dangers of the ship. And what ship-owner, builder, navigator, or underwriter, who is competent to judge of intrinsic merit in the form or construction of vessels, does not know that the strength of any fabric is only equal to that of its weakest part.

NATIONAL INSTITUTION FOR SEAMEN.

Ignorance and law have so long constituted the basis of education for seamen, that they have come to be regarded as naturally debased, and the worst passions and vices are fostered by the very means which are applied for their suppression. While commerce, in all imaginable channels and phases is replete with inducements, the best and only means of perfecting it on the great highway of nations, is left almost wholly to the chances of accident. Experiment without theory, practice without philosophy in its application, is required of no other class of men than those who pursue the most noble and self-sacrificing of all professions. *A sailor* is considered and treated as the personification of the acme of rudeness and vulgarity, incapable of self-reliance, only fit to serve a hard master; without a will of his own. Subordination to the will of another is deemed his best quality, and absolutely requisite to the perfection of his character. His extreme depravity above all other men, has been so long regarded as part of his nature, that it has become as familiar as a proverb, not only among civilized people and nations, but even in heathen countries. Not many years ago, while the ship's company of a man-o'-war on the East India station were ashore on liberty, on Sunday, following the bent of their inclinations, the idolatrous priests, and others of their faith and worship, in the fullest sincerity, organized and made use of means to prevail upon and convert the *Christian* sailors to embrace their religion and so become better men. It is well known that by the association of sailors abroad, the first expressions which the vulgar are able to utter in English, are oaths; and a traveller in Egypt relates his astonishment at having met natives in that country, who could utter the most awful oaths in the English language, although they knew no other words, and on inquiry he found that they had learned them of sailors.

They might truly say:

> "You taught us language; and our profit is,
> We know how to curse!"

This lamentable state of the sailor has arisen from the total neglect of those who reap the greatest benefit from his services.

There can be no question but that the noblest and bravest souls are those most likely to choose the occupation of sailors. The lad who fears no exposure, but whose restless mind is captivated by strange and novel scenes, at whatever peril, and as proud to know no fear as to face any danger, and who, incited by the warmest affections of the heart, loves and seeks danger for its own sake—is he of all others, most likely to choose the sea for the field of his labors, and having chosen it, all his foretastes and anticipations are not only confirmed but encouraged. His inceptions, which were at first weak with his age, are unduly expanded and strengthened in his manhood; and

far beyond the scope of any other occupation, his severest trials are those which endear him to his profession, and he becomes so wedded to the sea by the repetition of its perils, that in encountering it he learns to stare death in the face with a steadiness of nerve which never deters him from duty. Surround him by whatever difficulties, imperil him in the caldron of the hurricane, with the remorseless pirate or his country's foe, his dauntless mind is equal to them, and alike he encounters his greatest foe and his greatest love with an enthusiasm known to no other men. The rude school of the sea may render his aspect coarse, but it never effaces nor ruffles the gentle feelings which characterise the strength of his attachments, whether to the ship which has safely borne him, his commander, messmate or friend, for whom he is at all times ready to make any sacrifice. Yet no one can see selfishness where it is in the province of his occupation, sooner than a sailor. When a commander, under the garb of kindness, has some petty motive of selfishness to gratify, the penetration of the sailor is always equal to it, and no one so soon as such superior gains the deserved disrespect and contempt of his crew. Uneducated and unused to the ways of the world, put such an one on shore, it is not strange that his foresight is unequal to the less noble; that he is devoid of that reflection which would lead him to detect hypocrisy and deceit ever ready to entrap him; that he is bewildered, and eagerly joins newly-made comrades, whose only object is to drown his noble nature in alcohol, for their own selfish ends. Having entered the arena, the ardor of his nature knows no bounds, and he even now seeks to excel all in the indulgence of excesses, which to him have but one remedy, his ability to get to sea again, which is the cleansing draught to wash away the polluting stains of the shore, where all his worst nature is displayed. In the storm which threatens a wreck, or the battle which threatens his country, his steady, cool determination to conquer or die, renders him now the object of admiration and protection in a degree which should never be lost in the dens of freebooters, who await his return.

Those only who have witnessed and participated in the hail of "all hands up anchor for the United States!" can duly appreciate the joy which bursts from the hearts of a ship's company at the termination of a tedious foreign service. And as the breeze impels them homeward bound, all their hard toils are forgotten in the exultation at the prospect of realizing the pleasure of a speedy renewal of the joys of home. But, alas! how is the sailor met and cared for by those who have enriched themselves on his toils?

Did the Government and merchant consider the sailor's heart made truer to his country, or his devotion to their service increased by the most debasing excesses, they could not manifest less interest in his well-being on shore, than they do in their total abandonment of him to the unprincipled wretches who await with sharkish eagerness the harvest of a paid-off crew. The sailor no sooner escapes the perils of the sea than he is the object of attack

from those who live by preying upon his misery on shore. From the ship he is taken possession of by the crimp who shackles and plunders him, till he is glad to be exchanged—back to the ship again—for other game. Every temptation is allowed and tolerated to lead them into the greatest excesses, and the sooner they are pillaged of their earnings, so much the sooner are they again available for the service of their masters, to go through the same round of hardships and ill-treatment again and again, subjected to debauchery, druggery and robbery. A round of life thus quickly run ends at last, frequently in the forefeiture of large dues to the relationship of swearing crimps who have lived on his earnings during life, or to the ungrateful Government and merchants who permit it. Those who have received wealth and affluence from his labors, and who should be the first to rescue and protect him, hold, alas! that he is neither capable nor worthy of anything better, and so use and leave him to his fate.

Missionaries and others have in some instances redeemed the sailor from the vile corruptions to which a terminated voyage subject him ; but as the efforts of such individuals are spent on habits already formed, wholly devoid of proper early education and training, they can never benefit them as a class. Sailors left to themselves are like other men ; corruption and vice will spread in proportion as individuals rely wholly upon themselves for resources to obtain relief, and their disdain of charitable provision for their welfare, while they possess a conscientious ability to provide for themselves, however unfitted by education for any such reliance, far exceeds that of others ; and efforts to this end, indelicately conducted, frequently aggravate the condition which they were intended to relieve.

The occupation of the sailor renders his peculiarities as prominent and characteristic as do the manners and customs of different nations. His whole nature partakes of the mould of the sea, and he is too often deemed good and perfect in proportion as he is ignorant of everything else. Ignorant of the motives which govern men in occupations and ends wholly different from his, with susceptibilities far more acute than theirs, he is easily duped by those who would take advantage of his simplicity in the ways of the world.

The strength of his affections is child-like in confidence, and he works with a hearty good will to accomplish the labors endeared to him by every step in his hard toiled pilgrimage ; but when he applies his confiding nature to the lurking monsters of the shore, it is not to be wondered at that their touch contaminates him ; and while the universal proverb characterizes him with the company he keeps, the same vile dens of corruption too often furnish him with associates who commence, instead of end, their seamanship in crime. Hence it is that sailors have come to be regarded as lawless, and unfit for any other government than such as is applied to brute beasts ; and the entering a lad of even tolerable education as an apprentice to the merchant

or naval service, has been deemed the final disposal of an ungovernable or naturally base child—a separation of his disgrace from family and friends, who would from that time cease to remember him. No greater grief can be imposed on a fond mother, who may be familiar with the fact that some vile thief or murderer has shipped in the States' service, than to have a noble-hearted child seek the sea for his livelihood.

Equally debasing, too, is the thought that on entering such a livelihood, *officers* have so imbibed the spirit of shore-made sailors, as to display their authority in language and treatment, which no *man can* bear, and which *none but a sailor* has the courage to bear, for he knows the source of such treatment, and he rids himself of it as he would of the manufacturing den where he is wont to find it, by as speedy a clearance as possible.

The character which first impels the noble youth to the sea, may apparently be smothered for the time, but it is never wholly effaced. The quick and biding emotions, grateful and generous affections, and fondness for the marvellous, make them peculiarly susceptible to impressions calculated for their benefit. They may be superstitious, but their superstition is associated with faith in an over-ruling Providence, in a deep veneration for signs and omens, indicating an all-ruling Power, which controls their destiny, and makes them more passively the creatures of other men's wills, than pertains to any other class; and whatever they avow is characterized by an excess of ardor and devotion which, of all things else, is the sailor's distinction. What training, then, are not such characters worthy of? Their calling marks them above all other men for a field of usefulness, not only to their own, but to every country—their field is the world, in which they are not only the hired servants of commerce, but the civilizers of mankind.

No class nor *nation*—for they ought to be called nation—of men, on the face of the earth are so badly treated as sailors. Without education, without training, without any supervision whatever, they enter upon and endure hardships unequalled by any other avocation. Implicit obedience, without even the privilege of thought, is required of them, under whatever circumstances of duty; and, when off duty, they are waylaid and robbed of their hard earnings, for the support of the vilest criminals and paupers known to prisons and almshouses. The amount of misery, crime, and pauperism which springs from the non-education of sailors, is entailed on the community in a phase which has always attracted the attention and efforts of individuals and communities, yet they seem never to have taken into consideration that a large portion of the worst vices is sustained by booty obtained from pirates on shore, who live by plundering those who follow the sea. In addition to the wages paid sailors by Government and merchants, the public has to maintain criminals and paupers who owe their existence to vices which are sustained from this source, and there can be no doubt but that a most effectual means for the suppression of vice in our seaports would be found in the proper care and education of seamen.

The supremacy of the sea consists in the superiority of sailors, whether that superiority be displayed in war or commerce; and had not England's seamen been better cared for than any other nation's, her maritime power would never have been so long in the ascendency. With all the natural and national pride of English seamen, the American Government has given an equality of competition in trade to both domestic and foreign commerce, placing the sailor under less restraint, with increased rights, which has not only proved the American sailor's equality in all that pertains to him as an individual, but has caused his country to change places with England in being the vanguard in the commerce of the world.

In all ages and countries, national greatness has borne direct proportion to maritime commerce, and the wealth and prosperity of nations depend more upon sailors than upon any other class of men, while there is no class under any government so poorly paid and so badly treated as they are. This arises, in part, from the fact that a large portion of them, in dedicating themselves to the service of the sea, do not take the pay into account at all, and many enter upon it without knowing, beforehand, what they are to receive.

Once having enlisted for the sea, they are incapacitated for other pursuits in proportion to their progress in the knowledge and duties of their first choice.

Such is not the case with other men, either in choosing or following any pursuit. There are no such differences between the ordinary occupations of the land, as there are between them all and the sea. Hence it is, too, that for all the good qualities of his heart, as well as head, the sailor who has been such from his boyhood, is far superior to him who is constituted out of material seasoned to other use, or to him who seeks it for its pittance.

Education has never been deemed a necessity to the life of a sailor, and its benefit to him has been regarded a less important accessory than to those of other occupations. The indulgence of ignorance and excess has been excused in him because he is a sailor, until it has become to be regarded as part of his nature, or real element of his character. Of naval and maritime law, whatever relates to immorality and profanity is a dead letter. While the sailor is peremptorily required not to eat nor drink, sleep nor wake, nor even to express a thought but at the bidding of another, he is on shore, in the first place, taken wholly without education to the ways of the world, and cast upon the resources of his own untutored mind for everything necessary to his present and future existence.

His prowess and achievements on the sea, are extolled because of the nation under whose flag he serves, and not from any pride of the nation in him as an individual; hence, he is permitted debasing indulgences, which are deemed less criminal in him than in other men. His besotted ignorance is looked upon as if limited to the place and associates which are permitted, as

if for his benefit. His inborn energy, instead of being assisted to rise and vindicate itself, is left to grovel in ignorance and wear out in vice. "Every man," says Gibbon, "who rises above the common level, has received two educations: the first from his teachers, the second, more personal and important, from himself." Ignorance, so long as it is associated with innocence, does not protrude itself, but with age it becomes and grows more and more rude, obstinate, proud, censorious, and jealous—and it is these which constitute disobedience and insubordination. Ignorance is the ever-ready subject to turbulence. Twaddlers, who hold that the education of subordinates is dangerous, are only to be found among the conceited and jealous; and such of them as are masters, or be it officers and commanders, only fear what they should be made to feel, an inferiority to their servants. A free government reflects the opinions of its people. Is this principle inadmissible to the ship? Man, to be perfect, whatever his sphere, must be educated. The time has long passed when contented ignorance was deemed the quality *par excellence*, to rule the mass; and he who cannot risk his intellectual development with his fellow man, should be left to sink to his own level. The new powers which education developes in the mind of man, are only his inherent right, and the knowledge of power with a will to use it, always finds a sphere in which to wield it with a telling effect, co-equal with its increased strength to do good, and to resist evil. The tables of crime everywhere display the ignorance of criminals. Shall this test continue to bear our flag over the world?

The education of youth has in all time been regarded as the principal and most necessary care of law-givers; and the wilful neglect of parents to educate their children, has justly laid the penalty of shame upon them; yet our Government habitually practices this burning shame in the neglect of those whom she has adopted as her own, to bear her name and represent her interests to the ends of the earth!

We have a Naval Academy for the education of those of all others, who offer themselves to the Government, are most able to educate themselves, and to these are committed those who give themselves wholly to the service, many of whom are parentless, and have none to care for and educate them, and of these are our seamen. We would extend the scope and benefit of this institution to every youth in the land who would seek to be a sailor, while we would not incumber it with an unnecessary number for the object for which it is now maintained.

The privilege of education at the expense of the Government, should not be confined to those only who are to command and officer our ships of war, but it should be extended to the humblest boy who would be a sailor, and so adapted to both our naval and commercial marine, as to confer its benefits on them all. Admission to the Naval Academy should be permitted on a different basis, viz:—as candidates for officers in the navy, and the condi-

tions of their tenure, should be so modified, that only those graduates who were wanted at the time of graduation, should be appointed in the service—and they should be selected from those standing highest on the graduating list each year, the remainder having been educated at the expense of the Government, should cease their connections as graduates of the Naval Academy, as qualified for officers in the naval service, but beyond its wants, which would entitle them to positions in the merchant service.

We also would extend the benefits of the Academy to the apprentice system, not limiting it as now, to the number only which may be required for the naval service, but to such a number of healthy boys from each congressional district as would bear some proportion to the wants of both the naval and the merchant marine. A preference should be shown to orphans and those whose parental relations were most in need of such privilege. And such regulations and privileges, for their education and government, should be adopted, as would bear the same ratio, in time, as that for the education of officers in the Collegiate Department of the Academy; and at the end of the said period, so many of them as shall have reached a certain goal (to be established by the directors and faculty of the Academy, in reference to the superior requirements of the Collegiate Department) of good character and attainments, shall be admitted to contest with the collegiates, for the appointment of officers, and from those of them who are competitors for, but fail to obtain commissions, shall be the first in eligibility, for warrant officers in the navy; and from the rest, those who stand highest on the list, shall be given preference to all petty offices. From such an institution, should our whole navy and merchant marine be officered and manned.

There is in the United States' Treasury an amount of money forfeited to the Government by death and desertion in the navy, more than sufficient to establish such a National Institution for Seamen. From the foundation of our navy to the present time, money has been accumulating in the Treasury, from this source, which has never been appropriated. The actual amount is not known, but it could be ascertained from the pursers' books, at the Navy Department. Six years ago it was known to be *over a million and a half of dollars*, and the records were not half gone through with. The reis no channel into which this money could be so appropriately turned—and none from which the country would reap so much benefit.

An Inland Sea Discovered.—Letters from missionaries in the interior of Africa, bearing date of April of last year, speak of a sea in Africa, stretching southward from the equator to the tenth degree of latitude, and between the tenth and thirteenth degrees of longitude, east from Greenwich. The sea is, there, seven hundred miles in length, and about four hundred and fifty in breadth. Lake Nyassa is its south-eastern extremity.

IS THE U. S. STEAM FRIGATE MERRIMAC A FAILURE?

It is not because the subject of inefficiency in the Navy has been exhausted, that we change the caption from generals to a particular vessel, but on account of the sameness of its title, it would be less likely to secure the attention of our Naval friends. In our last issue we invited those who believed that the Merrimac was not a failure, to come forward, and we pledged ourselves to demonstrate that she was. It was not that we expected to be any better informed in reference to her inherent qualities as an efficient war steamer, that we desired to hear from those who believed that she was all right, but because we were desirous to know what was the real value of those opinions, by learning who were the individuals who endorsed them; we had thought it only necessary to analyze those opinions to make it apparent that they were only valuable to those who entertained them, and consequently could be of no real value to the Navy. We might here remark, that *principles only* can endure the test of analysis; but as all law, whether mechanical, commercial or judicial, is supposed to have common sense for its basis, we will apply this simplest of all standards to the "Merrimac," so that those who have opinions without principles to sustain them, may judge for themselves of the value of those teeming good qualities in the "Merrimac" of which so much has been said. Before these vessels were built, the Bureau of Construction sent one of its members to England to gather information from the workings of the steamers in the British fleet. The mission ended quietly; the steamers were commenced, and one of the six is completed, and has made a trial trip from Boston along our southern coast; during which time she has had one sham engagement, has lost part of her false keel at Norfolk, has been towed into Key West by her boats for repairs, and from thence she was towed to sea by the U. S. Steam Frigate Susquehanna, and finally was towed into Boston in a disabled condition. But what the real difficulty is no one can tell, or rather no one is allowed to tell. *Fortunately for ordinary minds*, *the law of common sense is no respecter of persons*, and by its bountiful provision, we have been endowed with a sufficient share to enable us to judge for ourselves. We have learned, we shall not be particular to tell where, when or how, that vessels could be managed, when in port, best by fasts from the head or stern, rather than by the more central or midship part; and inasmuch as the commanding and the propelling power, are both stationed aft on the "Merrimac," we shall pass a line out from our craft and make fast here, without going through the usual ceremony of boarding at the gangway. In commencing our observations, the first prominence which attracts our attention is that of a very heavy overhanging stern, (*apparently*) supported by an extra stern-post about midway between the main post and the taffrail, projecting several feet above water, to which the rudder is attached; between this after stern-post and the main one is the space allotted for the propeller, extending quite

through the deck. The first impression made upon our mind in viewing this arrangement is, why is this post, like a target, exposed to the enemy's fire, seeing that so much depends upon it? Would not an enemy direct all his fire at the head of this stern-post? And suppose he should be successful and hit it, what then?—why, the propeller and rudder would both be carried away. A single round shot is sufficient to deprive the ship of her rudder and propeller; and yet we are told that screw propulsion is best adapted to war purposes, because the screw is not exposed to the fire of an enemy. We should be obliged to any one who would show us the difference in effect between exposing the propeller, and the post that sustains it, to the fire of an enemy. Shall we be considered too inquisitive if we ask wherein the safety to the propeller consists—if, while submerged, the stern-post that holds it is liable at any moment to be shot away when in action? And if hoisted up out of the water, it is of no service, and becomes a target itself; wherein then does the security exist, of which so much favorable mention has been made? But it may be inquired, if we did not have English steamers for a model, and are not all the English war steamers so arranged? We say no; and if called upon to cite one exception, we name the *Rattler*, a vessel of much less consequence, because of much less size; and *we should not be inferior to our model, the English Navy, after having adopted it.* But aside from the exposure of the propeller post to the enemy's shot, we invite the attention of the Bureau to the insecurity of the propulsory power. The outer post is, say 25 to 26 feet in length above the keel, sided, say 16 inches, moulded, say 2½ feet at head (part of which is cut off in the rudder-post) by about 4 feet at keel; out of the siding size, viz., 16 inches, the rudder-braces require from aft-edge 1 inch on each side and from the forward edge for shaft bearing quite as much, leaving 14 inches of siding size; from this the fore and aft bolt holes exacts still another inch, which, with the rudder-post, we will not compute. Now, we hesitate not to say, that inasmuch as the propeller shaft is separate from the driving shaft, that 14 inches siding size in a length of 25 feet, is an insufficient amount of timber material to sustain the power of the Merrimac engines, without causing a transverse or vibratory motion, which, if it does not rupture the post, is likely to break the rudder pintles, and disable the rudder, besides the wear occasioned in the propeller journal by the shaft vibrating out of line. But in reference to another of the present difficulties, the wear of the journal, we have only to say, that it was too well known in *this country* to render an experiment necessary to determine the fact, that brass propeller shafts were not adapted to brass boxes—a leaf from the log-book of the "Rattler" would have shown this. But why go to England to learn that with which engineers are so familiar at home? The defects in the internal arrangement having been already shown in a former number, when the vessel lay at Norfolk, we shall cast off, and haul our craft along forward without going on board, and while doing so, we discover at the

same time that the load line of flotation, by the marks on the post, is about 24 feet, quite sufficient to shut all the ports of the United States, save five or six, against her entry, and which was the immediate cause of her losing a part of her false keel at Norfolk, one of the best ports, on the coast, on account of draught of water. Seeing so much exposure aft to an enemy, both above and below water, we may reasonably expect to find her more formidable forward for making her mark on a vessel of equal size. But, alas! we find that we are mistaken. While a sharper and faster vessel might not only give chase and overtake the Merrimac, but make such an incision in her overhanging stern as to leave the ship an unmanageable wreck, *as helpless as she was in the Gulf*, when being towed into Key West without the use of propeller or rudder. We would perhaps be told that her pivot and stern guns would prevent this. We say no; the enemy also has pivot and bow guns, and it would be much less difficult to place shot in the stern of such an ample protuberance, as is found in the stern of the Merrimac, than it would be to make a shot tell in the long length of a sharp bow; besides, the enemy's propeller is protected, and whatever may be the damage elsewhere, if well adapted for making her mark, on she comes.

Can the Merrimac do execution at this kind of warfare should the tables be turned, and were she the pursuer instead of the pursued? We say no! and because she would be crippled herself before she could cripple an enemy; her cutwater, jibboom, bowsprit, and head gear, must be all torn away, before the bow of the ship could make its mark, and if these were gone, the ship would alike be unmanageable, by the power of her sails. A war steamer should have no bowsprit overhanging the bow, to be carried away, or to encumber the operations of a chase. Of what avail are her two decks of guns if she cannot use them? *Has the principle to be learned by the Bureau of Construction at this late day, that a ship of war, like any other fabric, has only an amount of power or strength commensurate with its weakest part?* Of what avail is it to distribute guns upon two decks, while the stern is exposed to the scrutinizing gaze of an enemy, as he sweeps the water line around the stern with his glass, and at once discovers the exposed condition of the propeller and rudder, and how much depends upon his crippling her in this weaker part. But it has been said that the Merrimac is a fast ship; this we deny, (having seen both the model and ship.) That she is faster than some others, or than all others heretofore in commission, may be true, and when this is admitted, the story is half told; but it must be quite apparent to an ordinary mind, from what has been shown, that the *Merrimac is not an efficient war steamer*. We may be told that there are few, if any, better in the British Navy; and supposing that it were so, what does it prove? why, nothing at all, beyond this, that the Navies both of England and the United States, are in a state of decrepitude and "Inefficiency." If we supposed that in order to have a Navy it was necessary to have (in propor-

tion to its size) such a heterogeneous mass of spoiled materials as England has in her Navy, we should oppose a Navy with all the power we possessed, much as we are in favor of having one. We, in common with the rest of the civilized world, have seen the "Inefficiency" of the English Navy in the Eastern war—one of the chief difficulties was heavy draught of water. Has the new steamer been built with a view to profit by this failure? Could the Merrimac perform the service that the English steamers could not, on account of draught of water? Is not her draught of water equal, if not greater than theirs, when it should have been much less, and if adapted to our own coast, not much more than half of what it is? But how can England have an efficient Navy, when modelled and managed by Admirals instead of practical men, just as that of the United States was by the Board of Navy Commissioners, who, though not burdened so heavily with empty titles, knew quite as much about naval matters as British Admirals, to say the least of it. Notwithstanding Congress abolished the Navy Board, and established the more practical and efficient Bureau, yet so great are our inklings after the tinselings of power without qualification, that we must cross the Atlantic to witness the wholesale abortions of the British Admiralty, not with a view (as is apparent) to avoid their errors, but to follow their example and do even worse. When our mechanics and engineers leave home to feed the vanity of *blustering Admirals*, and throw their own judgment and share of common sense to the winds, is it not time that the press should furnish a rebuke? We shall not press any naval officer to follow us in this article beyond his depth, because we have restricted ourselves to the *science of common sense;* this latitude of right belongs to us, by the non-appearance of correspondents to assume the responsibility of saying the "Merrimac" was not a failure. We having pledged ourselves that when they did appear, we would show that she was a failure, we shall not now, as a consequence, carry our friends below the line of flotation on the outside of the vessel, in order to analyze the model.

It does not follow that, because England has built her fleet to fight from the broadside, that the United States are required to be so very obliging to John Bull as to follow him in this particular. A few large guns in addition to the ram principle, would revolutionize fleets, and place the English Navy, at best, as far astern as they now claim to be ahead; her fleet would be useless. For war purposes, the auxiliary principle is but an *ostrich* improvement at best. Cripple that bird in his wings, and he fails as a *runner*, while, if he be crippled in his legs, his pinions become shorn of power for flight; thus presenting the strange anomaly of an animal which can neither fly nor run effectually. It may be said that screw ships are built to *fight*, not to *run*. Very well; our motto would be to fight and conquer, but run rather than surrender. The introduction of auxiliary power in the British Navy was designed to save their large vessels from the inefficient list, and

to enable the hulks to keep pace with the smaller and more efficient vessels. The service of warfare is of too much consequence when entered upon to engage in any halfway measures. We have no fears of the surrendering of the crew when the ship is once destroyed. Our plan would be to destroy the vessel rather than the lives of the crew. We would prefer to render useless the ship, rather than the crew; it could be done in less time by steam than by powder, and with more direct certainty. If the vessel itself be the messenger, it can be directed with absolute certainty by the rudder, which (by the way of admonition) should be much more secure, and not be exposed like that of the "Merrimac." Such an improvement would be worthy of an independent nation, that cannot only think and act, but fight for herself on American principles, without copying or adopting the plans and failures of that imbecile old fogy we call Johnny Bull.

The idea of blowing up a war vessel, *properly constructed*, before she reaches her foe, is chimerical. There is no power in shot or shell to damage a vessel when coming head on, *if built right;* and who can contemplate the consequence of a blow from a war steamer built expressly for destroying her foe by this mode of warfare. One blow would be quite sufficient. We had supposed that this was the mode of operation intended by Mr. R. L. Stevens in the construction of the war steamer for harbor defence. Until we saw her, we had not the most distant idea that he meant to operate with guns.

THE SHIP OF STATE.

"Thou too, sail on, O ship of State,
Sail on, O Union, strong and great!
Humanity, with all its fears,
With all the hopes of future years,
Is hanging breathless on thy fate!
We know what master laid thy keel,
What workmen wrought the ribs of steel;
Who made each mast, and sail, and rope;
What anvils rang, what hammers beat,
In what a forge, and what a heat,
Were shaped the anchors of thy Hope!
Fear not each sudden sound and shock;
'Tis of the wave and not the rock,
'Tis but the flapping of the sail,
And not a rent made by the gale!
In spite of rock and tempest roar,
In spite of false lights on the shore,
Sail on, nor fear to breast the sea!
Our hearts, our hopes, our prayers, our tears,
Our faith triumphant o'er our fears,
Are all with thee—are all with thee!

MARINE DISASTERS

REPORTED FROM JANUARY 1ST TO JULY 1ST, 1856.

THE following is a statement of vessels reported lost, wrecked and damaged during the past half year. The amount of loss in each case, including vessel, freight and cargo, is as near as may be, and is believed to be under rather than above the actual loss.

TOTAL LOSS OF VESSEL AND CARGO.

Ships.	*From*	*To*	*Loss.*
Buena Vista	Trapani	Savannah	$35,000
Cortes	Anconia	Constantinople	30,000
Chili	Callao	Valencia	40,000
Calcutta	Boston	New-Orleans	75,000
Cape Cod	Calcutta	Boston	120,000
Greenwich	Chincha Islands	Hampton Roads	100,000
Great Duke	New-Orleans	Liverpool	200,000
Heber	New-Orleans	Liverpool	75,000
Horizon	Liverpool	New-Orleans	75,000
John Rutledge	Liverpool	New-York	200,000
Louis Napoleon	Baltimore	Liverpool	200,000
Lav Adams	Key West	New-Orleans	68,000
Mary Green	Liverpool	Philadelphia	65,000
Meteor	New-York	Marseilles	80,000
Potomac	New-York	Australia	75,000
Siam	Liverpool	Savannah	25,000
Sebago	New-York	Falmouth	130,000
Sea Witch	China	Havana	40,000
S. Brown	New-York	Havre	110,000
Tejuca	New-York	Queenstown	80,000
Valparaiso	New-Orleans	Liverpool	65,000
W. Hitchcock	Savannah	Havre	150,000
Barks.			
D. S. Goodell	Rio Janeiro	New-York	$15,000
G. Von Oxholm	St. Croix	Turks Island	15,000
Independence	Liverpool	New-York	100,000
Isaac Hyne	Hong Kong	San Francisco	125,000
Mary Dunham	New-York	Glasgow	100,000
Olinia	Cardiff	Savannah	60,000
Peacock	Salem	Mauritius	15,000
Pristis	Buenos Ayres	New-York	100,000
Roxana	Newcastle	New-York	15,000
T. Ritchie	New-York	Dordrecht	46,000
Venezuela	Porto Cabello	Philadelphia	25,000
Brigs.			
Dolphin	Porto Rico	New-York	$15,000
Free Trade	New-York	St Johns, N. F.	20,000
Gray Eagle	St. Johns, P. P	New-York	20,000
G. Spear	New-York	Para	30,000
L. H Chase	Wiscasset	Cuba	12,000
Matinie	New-York	Havana	10,000
Maria Anna	St. Johns, N. F	Boston	6,000
Marden	Boston	Montevideo	15,000
Mary Dunham	New-York	Glasgow	100,000
Neptune	Baltimore	Havana	12,000
Rivulet	Philadelphia	Aspinwall	12,000
Richmond	Gonaives	New-York	20,000
Sarah Ellen	Portland	Philadelphia	10,000
S. E. Dix	Santa Cruz	Nuevitas	10,000

Brigs.	*From*	*To*	*Loss.*
S. J. Peters	New-Orleans	Havana	$18,000
Sylvania	St. Thomas	Philadelphia	25,000
T. A. Cunningham	New-York	Pensacola	10,000
Schooners.			
A. G. Cattell	Philadelphia	New-York	$ 8,000
A. Clifford	Portland	Savannah	8,000
Alabama	Baltimore	West Indies	24.000
Bustamente	Hong Kong	San Francisco	15,000
Clarendon	Norfolk	Boston	12,000
Don Nicholas	Boston	Richmond	6,000
Eagle	New-York	Bermuda	20,000
E Manning	Staten Island	Norfolk	5,000
Echo	Baltimore	New-York	10,000
Francis	Newfoundland	Boston	10,000
G. D. Fisher	Philadelphia	Norfolk	35,000
Grace Darling	Savannah	New-York	10,000
George P. Sloat	Pensacola	Key West	5,000
H. C. Mead	Norfolk	New-York	15,000
Henry Freeling	Bath	James River	10,000
J. H. Dilks	New-Orleans	Aranzas	10,000
J. R. Price	Philadelphia	Alexandria	7,000
Lucy	Aux Cayes	Boston	20,000
Mount Spring	Whaler		15,000
North Light	Aux Cayes	Boston	12,000
State of Maine	Frankfort	Cardenas	12,000
S. F. Norton	Portland	Havana	14,000
Texana			5,000
Tioga	Boston	Cardenas	12,000
Ultra	New-York	Pernambuco	16,000
W. B. Williams	Philadelphia	Norfolk	5,000

VESSELS SAILED BUT NEVER HEARD FROM.

Vessels.	*From*	*To*	*Loss.*
Agnes	Rio de Janerio	New-York	$130,000
City of Montreal	Liverpool	Quebec	90,000
Driver	Liverpool	New-York	250.000
High-Flyer	San Francisco	Hong Kong	75,000
Havana	New-York	Londonderry	20,000
Leah	New-York	Antwerp	230,000
Ocean Queen	London	New-York	200,000
R. Carnley	New-York	Antwerp	210,000
Pacific, steamer,	Liverpool	New-York	1,500,000
Angostura, brig,	New-York	Cork	36,000
H. W. Moncure, brig,	New-York	Londonderry	20,000
Sican, schooner,	New-York	Rio de Janeiro	24,000

LOSS NOT ENTIRE.

Vessels.	*From*	*To*	*Loss.*
Albatross	London	Calcutta	$7,000
Adriatic	Boston	Buenos Ayres	12,000
Atlantic	St. Domingo	Boston	12,000
Ashburton	New-Orleans	Liverpool	10,000
American Congress	London	New-York	10,000
Anna Titt	New-Orleans	Liverpool	10,000
Abraham Langdon	Havre	Savannah	15,000
Ad Lemont	Baltimore, Maryland	New-Orleans	60,000
Adele	Savannah Le Mar	Amsterdam	32,000
Adriana	New-York	San Francisco	112,000
Adrian	Baltimore	Belfast	40,000
Bowditch	Calcutta	London	10,000
Burnham	Hong Kong	San Francisco	10,000
Barclay	(Whaler)		15,000

Vessels.	*From*	*To*	*Loss.*
Boomerang	Mobile	Liverpool	$190,000
Blanchard	Charleston	Bremen	40,000
Charlotte	San Francisco	Valparaiso	20,000
Conquest	Boston	New-Orleans	8,000
Cheshire	Callao	Valencia	50,000
Canton	New-York	Rotterdam	15,000
C. Jenkins	Cuba	Swansea	40,000
Chicago	Liverpool	New-York	20,000
Clara	Boston	Portland	15,000
C. Perkins	St. Thomas	New-York	6,000
C. A. Libby	New-York	Vera Cruz	75,000
Cape Fear	New-York	Cienfuegos	15,000
Dirigo	Glasgow	New-York	10,000
Dalmatia	China	Callao	15 000
Ellen Austin	New-York	Liverpool	60,000
Empire State	New-York	L verpool	10,000
E. Dennison	New-York	Antwerp	25 000
Euterpe	London	New-York	30,000
E. Mallory	New-Orleans	Genoa	10,000
Edward Everett	Baltimore	Cork	10,000
Fortitude	Smyrna	New-York	6,000
Flying Arrow	Melbourne	Batavia	50,000
Frances	Boston	New-Orleans	20,000
Gen Worth	Cardenas	Portland	5,000
Henry Pratt	Mobile	Liverpool	20,000
Helen Augusta	Whaler		30,000
Huguenot	Ph ladelphia	Salinas Bay	32,000
Hopewell	(Whaler)		9,000
Isaiah Crowell	Calcutta	Boston	8,000
Irene	Liverpool	Boston	40,000
Isaac Allerton	Liverpool	New-York	10,000
John Knox	Liverpool	Mobile	16,000
J. Thompson	New-York	Liverpool	15,000
John Ravenal	Bordeaux	New-York	20,000
James Guthrie	Mobile	Ferrol, Spain	40,000
Kathay	Shanghae	New-York	12,000
Lydia Brooks	Virginia	Newburyport	5,000
Lucy Ann	Australia	San Francisco	30,000
Messenger	New-York	Falmouth	10,000
Mecklenburg	Washington	New-York	5,000
Marseilles	Calcutta	Boston	15,000
Mary Hale	New-Orleans	Trieste	70,000
Mariner	Liverpool	New-Orleans	70,000
Motto	Darien	Boston	10,000
Mary Taylor	Talcah'no	Sydney	40,000
Martha	St. Andrew	Indianola	15,000
Ned	Wilmington	New-York	5,000
Northern Crown	Liverpool	Philadelphia	18,000
New-York	New-York	Mobile	60,000
Nan Plaisted	Georgetown	Boston	9,000
Occident	B. Ayres	Portland	40,000
Ocean Home	New-Orleans	Rotterdam	6,000
Ocean Pearl	New-York,	Havre	6,000
Pioneer	Antwerp	Baltimore	75,000
President	Liverpool	Boston	90,000
Pantheon	(Whaler)		15,000
Red Gauntlet	New-York	San Francisco	10,000
R. L. Gilchrist	New-Orleans	Liverpool	40 000
Ravenswood	Havre	New-York	60,000
Racer	Liverpool	New-York	230,000
Stingray	Canton	New-York	180 000
Siddons	London	New-Orleans	25,000
S Gildersleeve	New-Orleans	Havre	8,000
St. Denis	New-York	Havre	160,000
Star of the West	Liverpool	New-York	20,000
S Carolina	New-Orleans	Liverpool	12,000
Splendid	Havre	New-York	25,000

Vessels.	*From*	*To*	*Loss.*
Shooting Star	Honolula	New-York	$18,000
S. Walker	New-York	Valparaiso	75,000
Sentinel	Boston	New-Orleans	60,000
S. C. Thwing	Mobile	Gottenburg	100 000
Salem	Ohio River		25,000
T. W. Sears	Singapore	New-York	10,000
Telegraph	City Point	Melbourne	40.000
Talisman	St. John's	Liverpool	38,000
Tigress	Philadelphia	Liverpool	20,000
United States	Newport	Mobile	6,000
Underwriter	Liverpool	New-York	20,000
Vernon	(Whaler)		10,000
Vermont	Baltimore	Cork	8,000
W. Continent	Calcutta	New-York	40,000
Westernport	Portland	New-York	10,000
Wellfleet	New-Orleans	Liverpool	18,000
Woodcock	New-York	London	85,000
Wakalla	Philadelphia	Bangor	11,000
Wetumpka	Mobile	Cardenas	6,000
Yorktown	Ohio River	Ohio River	20,000
Barks.			
Adjuster	New-York	Schiedam	$10,000
Almira	Cardenas	Portland	25,000
A. F. Jenness	Norfolk	Antwerp	65,000
Archimedes	Shields	Boston	20,000
Ann	New-York	New.Orleans	12,000
Bristol Belle	Gibraltar	New-York	10,000
Burlington	Leghorn	New-York	12,000
Benjamin Adams	Boston	Mobile	25,000
Barclay	Whaler		10,000
Cloclia	New-York	Constantinople	20,000
Catherwood	Whaler		35,000
Cabasa	Cienfuegos	Boston	30,000
David Nichols	Cardenas	Portland	12,000
Delegate	New-York	Boston	17,500
Emma	New-Orleans	Boston	5,000
M. F. Chase	Cardenas	Portland	3,000
Echo	Baltimore	Boston	10,000
Gem	Africa	New-York	15,000
James	Quebec	St. Ives	40,000
John Farnham	Havana	New-York	15,000
John Stroud	New-Orleans	New-York	25,000
J. Forbes	Guayama	New-Haven	25,000
Lean Racer	Palermo	Baltimore	50,000
L. Sears	Constantinople		9,000
Lucinda	Matanzas	New-Orleans	50,000
Lucy Ring	Montevido	Liverpool	30,000
Mess Bird	Boston	Valparaiso	25,000
Mary Varney	Norfolk	Guadaloupe	10,000
Mermaid	Bombay	China	55,000
Occident	Buenos Ayres	Portland	40,000
Regatta	New-York	Constantinople	
Samuel Train	Lisbon	Rio de Janeiro	7,500
Spirit O' Sea	Palermo	Baltimore	6,000
Storm	Hong Kong	San Francisco	20,000
Sumpter	Charleston	Liverpool	18,000
Swan	St. Catharines	Bahia	12,000
Tammany	New-Orlenns	Boston	7,000
William A. Banks	Pensacola	Montevideo	5,000
Warren	Philadelphia	Queenstown	15,000
William Lararbee	Cienfuegos	New-York	28,000
Yarmouth	Venice	New-York	45,000
Brigs.			
Atlantic	St. Domingo	Boston	$12,000
Arcadia	Havana	Portsmouth	12,000

Brigs.	*From*	*To*	*Loss.*
B. Strout	New-York	Trinidad	$12,000
Canada	Cambria	New-York	20,000
Crusader	Jacksonville	Bordeaux	20,000
Clement	Baltimore	Boston	8,000
Cape Fear	New-York	Cienfuegos	15,000
Conquest	Pernambuco	Boston	25,000
Daniel Duffield	Boston	Smyrna	5,000
Demerara	Cardenas	New-York	12,000
E. L. Cotterell	Boston	Havana	12,000
Emeline	New-York	Constantinople	25,000
Extra	Tobasco	New-York	17,000
Gazette	Surinam	Salem	8,000
General Worth	Cardenas	Portland	5,000
Gulnare	Charleston	Cienfuegos	16,000
George	Savannah	Boston	15,000
General Wilson	New-York	Mobile	35,000
G. W. Lawrence	St. Jago	Trieste	22,000
Geo. Otis	New-York	St. Jago	18,000
Haidee	Jacksonville	Curacoa	8,000
Kong Thuym	Rochelle	New-York	40,000
Lion	Bangor	Havana	10,000
Lucretia	New-York	Marseilles	15,000
Linden	New-Orleans	New-York	15,000
M. B. Dains	New-York	Galveston	15,000
Motto	Darien	Boston	10.000
Naratiska	St. Jago	New-York	5,000
Ocean Bird	Halifax	Liverpool	35,000
Rubicon	New-York	Emden	30,000
Samuel and Edward	Montevideo	New-York	12,000
South	Galveston	New-York	15,000
S. Morrill	Boston	Matanzas	8,000
Samuel and Edward, No. 2.	New-York	Buenos Ayres	12,000
Vesta	Gibraltar	Boston	9,000
Vermont	Baltimore	Cork	8,000
W. A. Stafford	Demerara	New-York	25,000
Webster	Canary Isles	Boston	10,000
W. Hamilton	(Whaler)		45,000
Wetumpka	Mobile	Cardenas	6,000

Schooners.			
Alex. M.	Norfolk	New-York	$ 3,000
Ann Hymen	West Indies	Newburg	6,000
B. J. Arthurs	Jamaica	Havana	6,000
Becket	Washington, N. C.	New-York	8,000
B. L. Berry	Beaufort, N. C.	Martinique	28,000
Charles Colgate	Baltimore	New-York	20,000
Clara Jane	Barbadoes	New-York	12,000
California	Haytien	Boston	18,000
Cyclone	Darien	Boston	10,000
Clara	Boston	Portland	15,000
C. Perkins	St. Thomas	New-York	6,000
C. A. Libby	New-York	Vera Cruz	75,000
Daniel Webster	New-York	Millbridge	5,000
Excelsior	Port au Prince	New-York	8,000
Ellen	Boston	Marseilles	15,000
Entire	Attakapas	Baltimore	5,000
E. W. Gardner	Charleston	New-York	14,000
Eckford Webb	New-York	Glasgow	10,000
Edward Everett	Alexandria	New-York	6,000
Fannie Currie	Glasgow	New-York	5,000
Flash	Jeremie	Boston	5,000
George Savary	Jacksonville	Boston	8,000
George Parker	Bangor	New-York	8,000
Henrico	New-York	Richmond	3,000

Schooners.	*From*	*To*	*Loss.*
Josephine	New-York	Dover	$12,000
Jesse W. Starr	Port au Prince	New-York	6,000
John and George	Portland		8.000
Kate Helen	Attakapas	Baltimore	8,000
Kensington	Mexico	New-York	5,000
Lydia Brooks	Virginia	Newburyport	5,000
Lonsdale	Providence	Philadelphia	25,000
Lucullus	St. Mary's	Pembroke	10,000
Louisiana	Savannah	New-York	65,000
Louise	Boston	Mobile	42,000
Mary Nile	Norfolk	New-York	5,000
M. D. Scull	Havana	Baltimore	28,000
Mount Eagle	Kingston	New-York	5,000
Mary C. Ames	Ponce	Boston	9,000
Montauk	Alvarado	New-York	6,000
May Flower	Georgetown	Boston	10,000
Mobile	Mobile	Liverpool	50,000
Mary Cobb	New-York	Portland	6.000
M. Burgess	New-York	Martinique	15,000
Martha	St. Andrew's	Indianola	15,000
Ned	Wilmington	New-York	5,900
N. Chester	Savannah	New-York	15,000
Nan Plaisted	Georgetown	Boston	9,000
Ophir	Norfolk	Portland	6,000
Plandome	Savannah	New-York	5,000
Pacific	Washington	New-York	6.000
Rainbow	New-York	Corpus Christi	18,000
R. Miller	Norwich	Boston	10,000
S. Elizabeth			5,000
S. A. Hammond	Malaga	New-York	8.000
Sarah Libby	Boston	Machias	2,500
Samuel P. Lord	Baltimore	New-York	12,000
Sar. Victoria	St Jago	Philadelphia	9,000
Sarah Bruen	New-York	Georgetown	6,000
Tempter	Charleston	Providence	40.000
Telegraph	Mobile	New-Orleans	6,000
W. G Gatzner	Buckville	Charleston	8,000
Wakalla	Philadelphia	Bangor	11,000

Steamers.			
Albertine	Ohio River		$18,000
Alabama	Mobile	Up River	40,000
American Banner	Philadelphia	Norfolk	3,000
Bridge City	Ohio River		20,000
Cuba	Alabama River		30,000
Flag	Ohio River		20,000
Grape Shot	Ohio River		25,000
Henry Lewis	Cincinnati	New-Orleans	40,000
Kalama	San Francisco	Sandwich Islands	30,000
Leviathan	New-York Harbor		50.000
Madonna	Ohio River		22,000
Osprey	S. Martha	New-York	45,000
Plym. Rock	Stonington	New-York	18,000
Samuel Berry	Beaufort	Wilmington	20,000

218 other vessels, of all classes, arrived at various ports with more or less damage to hull, spars and rigging, and were reported at an expense varying from $500 to $10,000 each. The total estimated........ $1,150,000

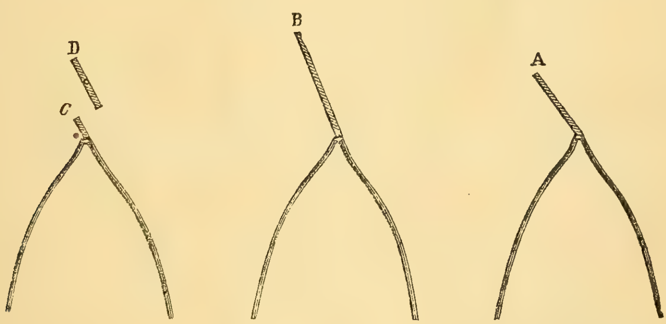
The damage to cargo arriving coastwise, and also from foreign ports, in many cases after long and boisterous passages, from the best data that can be obtained, was.... 2,800,000

Total........ $15,890,500

THE RUDDER.

It will be remembered, by reference to the June number of the U. S. Nautical Magazine and Naval Journal, that several articles have appeared upon the subject of rudders. The first, in reference to that of Robbins' Patent Rudder, appeared in No. 1, vol. 4, which called forth some remarks from a correspondent, R. W——, to which we replied, and he subsequently re-app ared, and we replied. Not having heard since from him, we may further remark, by way of assisting him in his investigations, and placing him, or others who may chance to doubt, on a more reliable basis.

The effort of the rudder may be measured by the power applied at the wheel; the tiller purchase being the same, a wide "rudder" and a narrow one will have the same effect (within certain limits of breadth) to steer the vessel, because, if it be wide, it will not require, nor can the wheelsman bring it to the same angle *in the same time*, to be put so far to one side as it would, if narrowed to the same amount of steering. Thus: it will require the same force at the wheel to move the narrow rudder, A, to its present position, as shown in the engraving, as to move the wide one, B, to its position; the power being the same in both cases, the efficiency of rudders must be equal.



Now, then, the value of Robbins' rudder must consist in placing the axis or stock in the middle of it, whereby its controllability is enhanced, and hence, although wider, the rudder at D. may be moved with less power. But the chief improvement consists in using the water from *both sides* of the vessel, as shown in the engraving; and the rudder hung on the post at C. is of little value, inasmuch as it tends to complicate the gear. It has been demonstrated, beyond the possibility of cavil or doubt, that a rudder hung with the axis at the middle of the blade, as shown at D., is more effectual, with equal area, or equally effectual with less area, than the present form of rudder—a consideration by no means to be lightly considered by nautical men.

SUBMARINE BLASTING.

THE Pasley Blast, introduced in 1839 by Lieut. Genl. Pasley, of the Royal Engineers, in the removal of wrecks, and subsequently in the removal of rocks from the harbors of Bermuda and Nassau, is now being applied in the harbor of New-York to Diamond Reef. This is the largest work of the kind which has yet been undertaken, the rock having an area of about 18,000 square feet, upon which there is a depth of only 16 feet at low water. It is about 300 feet long, by 60 feet wide, and is very hard; its removal to a depth of 22 feet at low water has been the subject of a contract by Messrs. Husted & Kroehl, at a cost to the city of $35,600. The reef lies near Governor's Island, a short distance from the usual route of the South Ferry boats, and has become a serious impediment to the navigation of this harbor, owing to the large size of modern ships, and their consequent increased draught of water. The contractors commenced operations on the 7th of June, and have since been firing from six to ten enormous charges per day. The latter are contained in large tin canisters, each holding 200 pounds of powder, or eight kegs of 25 pounds; so that the value of each charge is about $40. These are sunk to the surface of the rock, and discharged by means of a wire connected with a galvanic battery.

On the 5th of July we spent the short interval of slack water, the time allotted for operations, on the spot with the operators, and witnessed the effect of six discharges, and again on the 10th, we witnessed similar demonstrations, two of which were much greater, and the greatest charges ever fired upon sunken rocks since the introduction of this mode of blasting under water, the charges containing five barrels of powder each, which were sufficient to satisfy us that this blast would have made a most effectual demonstration on, or a demolition of, the Baltic fleet when on its voyage of "experience," had it been properly applied, as it may be to any fleet of vessels entering a roadstead or harbor, quite as effectual as to a single vessel, and any harbor may be protected most effectually against the destructive propensities of a belligerent naval force. It was at high water, when there was at least 21 feet of depth upon the rock, or the greatest amount of pressure exerted upon the rock's surface. The phenomena is interesting. An immense body of water is suddenly raised from the rock, (notwithstanding the enormous weight or pressure upon it,) in the form of a dome, from 50 to 150 feet in diameter, depending upon the weight of the charge. For a moment it retains its elevation, and then bursts at the apex, columns of water shooting forth in a perpendicular or oblique direction, of snowy whiteness, sometimes to the height of 150 feet. The commotion then subsides, leaving the water covered with foam and large numbers of dead fish, killed by the concussion. Diamond Reef has long been celebrated as a fishing ground, and the mortality from this cause among the piscatory tribes, is very great. The force of the explosion is tremendous, and the tremor of

the earth very distinctly may be felt on Governor's Island. The discharge is accompanied by a heavy rumbling sound, like the peals of distant thunder. Sometimes as many as four distinct reports are heard, and never less than two, one below, and the other at the bursting of the water above the surface. The manner in which the rock is affected may be thus explained:

"By the expansive force of the explosion, the large mass of water above and around must be instantly removed or lifted. But as the motion of all matter requires time, the expansive force is exerted instantly in every direction. It will not willingly wait for the slow rising of the mass of water high enough to afford it relief. It therefore makes its way at the same time downwards upon the solid rock, crushing, crumbling, and grinding it to pieces. All matter, so far as we know, is porous and compressible, and rocks are more compressible than water. Philosophy, therefore, teaches us that a sudden expansive force between a body of water and a body of rock, while it requires *time* to remove the water, must necessarily, to some extent, crush the surface of the rock, if it is too large or too confined to be removed in a body. And this has proved to be the fact, by every blast that has been made, by examinations, one of which was made while we were present on the first occasion referred to.

The explosive force being exerted vertically, and downward, no fragments of rock are driven above the surface of the water. Most of the rock is pulverized; all the large pieces are removed by divers or by grappling irons, to the deepest surrounding water, which is from thirty to forty feet. The work is making very good progress, and it is expected that it will be wholly completed by September next. Husted & Kroehl are the same parties who removed "Merlin Rock" from the harbor of St. Johns, N. F., last season, in behalf of the Newfoundland and London Telegraph Company.

THE PEN.—The time was when the sword was the all-conquering instrument for avenging human wrongs; an era of darkness and of gloom. As the arm became weary with its unnatural tension, and the mind became loaded to satiety with the surrounding tide of blood, a new era dawned, and gunnery and fire-arms were the watchword in the settlement of national disputes, while for personal disputations, powder, ball and pistols were the only antidote for the *chivalrous*. But these days have fled, and the *pen* is now the all-victorious weapon. The *pen* hurls defiance at the sword, and the cannon, with its sable dress, remains silent, while the *Treaty* speaks in tones of authority to civilized man.

The *Pen* holds out the sceptre of peace and satisfaction to the wounded sensibilities of the man and the monarch, the citizen and the subject. But the genius of the pen stops not here; man's inventive genius has been taxed to improve its condition and enhance its value, and now we have *Prince's Protean Fountain Pen*, as the most economical in practice, and the most efficient in purpose, self-supplying from 3 to 10 hours, according to its size. It is worthy of the attention of the commercial and literary world. It may be had of T. G. Stearns, 290 Broadway, corner of Reade street., New-York.

THE RESISTANCE OF VESSELS.

A CORRESPONDENT inquires, how the resistance of vessels may be computed, and what is the ratio of power to speed at different velocities?

The computation of the actual resistance of a given vessel, from theory alone, is a difficult problem. Experimenters upon the resistance of bodies moving in fluid, have expressed the results of their observations and reasonings in formulas, for the solution of this problem, it is true; and judging from the positiveness with which their scientific deductions are stated, it might be inferred, no doubt should exist relative to the truth of those rules which are given to compute the resistance of vessels. We, however, are far from placing implicit reliance upon the truth of any theory, which we have yet found in print, for solving the resistance of vessels.

Without entering far into the mysteries of mathematical formulas, we will briefly sketch a description of the manner of approximating the resistance of a vessel from theory alone.

The dimensions of length, breadth, and draught of water being given, compute the displacement in cubic feet; ascertain the depth of its centre of gravity below the surface; and obtain the area of the greatest immersed section, (which is the dead flat area.)

Thus, assuming the following dimensions:

Length on the load line	180.00	feet
Beam " " " "	26 00	"
Draught of water	13.00	"
Displacement in cubic feet 30,782		
Depth of centre of gravity	5.75	"
Greatest immersed section 300 square feet.		

Now, as the amount of resistance met by a vessel at sea varies with the *mean angle* of resistance, for such vessel recourse is had to the cubic contents of displacement, and the area of greatest transverse section to evolve it. The radius of the "circle arc" is first obtained; then the angle of this arc with the middle line of the vessel is found; and lastly, the mean angle of resistance is calculated, the operation being as follows:

The radius of the "circle arc" (supposing the lines of half breadth plan to coincide with an arc of a circle, which is never the case however,) is equal to

$$\frac{180^2 \times 13}{8 \times 5.75 \times 26} + \frac{5.75 \times 26}{2 \times 13} = 357.25 \text{ feet.}$$

The angle of the circle arc is found by

$$\frac{200 \times 30782 \times 5.75}{300 \times 13 \times 357.25} = 25.4 \text{ degrees.}$$

By reference to a table calculated for the resistance of figures formed by the arcs of circles, (the mean angle of resistance for a circle being set down

at 39° 34′,) we find the angle of resistance for a circle arc of 25 degrees to be equal to 12° 53′, and for an arc of 26 degrees to be equal to 13° 22′, the circle arc of our example being equal to 25° 4′, requires a few figures in addition to our reference to the table, to deduce a more accurate result, thus: 13° 22′ less 12° 53′ is equal to 0° 29′, which, multiplied by 0° 4′, is equal to 11° 6′; to 12° 53′ add 0° 11′, sum equal to 13° 4′. The angle of resistance is therefore found to be equal to 13° 4′.

Now, as the resistance to motion is said to vary *as the square of the velocity*, (no matter what the displacement and form,) and as, in the case of particular examples, it is proportional *as the square of the sine for the angle of resistance*, we are offered the following formula for computing the resistance of a vessel in pounds:

$$R = \oplus V^2 \sin.^2\Phi\,(1 + 8 - \sin.^2\Phi \cos.\Phi)$$

In which R denotes resistance, $\oplus$ the area of greatest transverse section, V. the velocity in feet per minute, Φ the angle of resistance, and 8 the co-efficient of hydrostatic pressure.

The *friction* between the surface of the vessel and the water, and the *cohesion* between the surface and the fluid, (which is always increased by foul bottom,) as well as the *form* of a vessel, are elements in the resistance of vessels to which it is well nigh impossible for calculation to approximate closely. We conceive that it is only by actual experiment with a vessel itself, that the amount of resistance in weight, at a given speed, can be determined; and if this can be done with the vessel, why cannot experiments of a less costly nature, with the *model*, reveal to us the hidden answer to our inquiries.

In the present state of knowledge on this subject, we would place far greater reliance upon a well-conducted experiment with the *model*, than upon any calculations that could be made.

The *power* applied to propel a vessel, whether steam or wind, is the measure of that vessel's resistance.

Readers having the curiosity to peruse a short but comprehensive treatise upon the *Resistance to Bodies in Motion in Fluid*, can find one in "NYSTROM's Treatise on Screw Propellers, and their Steam Engines, 1852, published by H. C. Baird, Philadelphia." The author is an ingenious engineer and mathematician, and his little work is the only one by an author in this country. Although a member of the old school of mechanics, in regard to the location of the greatest transverse section of vessels, his theory of the resistance of bodies moving in fluids shows as conclusively as calculations can, that the "angle of resistance" has more influence upon the velocity of a body than the "angle of incidence." In other words, the resistance is diminished by propelling the body with the *sharpest* end forward, and increased by propelling it with the greater angle to the fluid; a result which Mr. Nystrom observes is in conflict with "experiments and generally

received rules among shipbuilders." What experiments there may be to oppose such a self-evident proposition, he does not cite, nor do we know; and we certainly regard the figures from which this author has made his computations showing the above result, as approximating nearer the form of a vessel's displacement than that of a parallelopiped, at the fore end of which he assumes an imaginary *motion* of the water to take place, which diminishes the *minus* pressure, and is proportional to the ratio of length to side within certain limits. After acknowledging the difficulty of setting up theories for bodies moving in fluids, he adds: "It is this motion which causes the vessel to have less resistance when the greatest transverse immersed section is more forward." We regard this as an attempt at explaining what is not the fact. His figures and opinions appear to clash, and the latter to triumph. If there is no truth in the theory, why is it published? and, if it be true in the main, why attempt to conciliate prejudices by *supposing* a motion of the water? Whatever reasons may exist for confining the location of deadflat frame to the forward body of vessels, the attainment of high speed cannot be one; for facts, if not theories, will sustain the principle of keeping the angle of resistance within the angle of incidence, or the angle of the bow within that of the stern.

The ratio of power to speed varies nearly as the cube of the increased velocity. To double the speed of a vessel after she has attained the amount adapted to her shape and power, will require four times the primary force acting through twice the distance in the same time. Eight times the original power will therefore be required.

It is set down by some authorities that the speed which may be attained by a large vessel will be greater than that of a small vessel of a similar model and proportionate power, in the ratio of the square root of the linear dimensions of the vessels. Consequently, a vessel of twice the length, with four times the sectional area, and hence of eight times the capacity, will have its speed increased in the proportion of the square root of 1 to the square root of 2, or 1.4 times. This disparity in performance is chiefly owing to the greater proportionate degree of friction and angular motion of the smaller vessel. A smooth, clean bottom, is a desideratum to mariners.

PRIVATEERING.—At the last sitting of the German Diet, the Russian Envoy put in a note in conformity with those of the other Powers, which signed the treaty at Paris, calling upon the assembly to adhere to the declaration respecting the rights of neutrals, and the abolition of privateering. It is believed that when the adhesion of all European Powers is obtained, Europe will call on the United States to adopt the same principle.

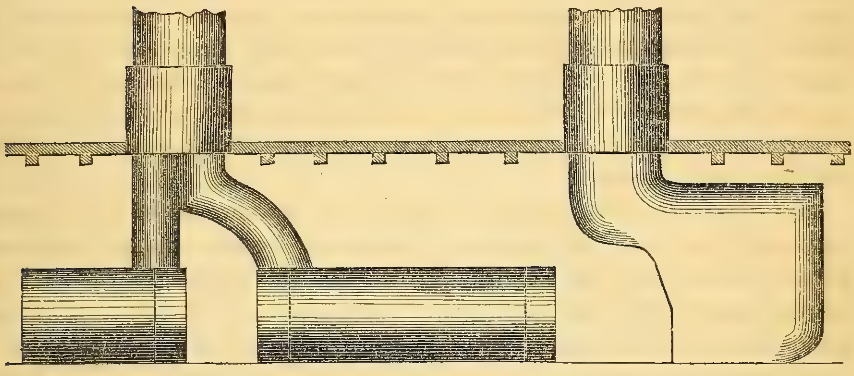
THE GUN-BOAT QUESTION SETTLED FOR THE PRESENT.

LIGHT CAVALRY OF THE BRITISH NAVY.

We furnished a general description of six of this new style of vessels so recently inducted into the British Navy, in the last number of the Magazine, and shall now furnish a description of the propulsory power and boilers of this *musquito fleet*, from which so much was expected, and so little obtained.

Screws.

Pitch of Screw—21 ft. 6 in.
Diameter of Screw—11 ft.
Length of Screw—3 ft.



Boilers.—To get this amount of boiler power into such a small vessel, and to keep that under the water line, not a little ingenuity has been displayed. The boilers are in six pieces, placed in pairs across the ship. Four of the boilers are called the *fighting* boilers, because they are so low as to be under the water line. They contain about two-thirds of the power, and will be ample for speed when manœuvring in action. The two high boilers are only used when full speed is required. We give leading particulars of the boilers.

Number of boilers—6 pieces (2 high and 4 low).
Number of furnaces—18 (6 in. high and 12 in. low).
Diameter of tubes—2½ inches.
Diameter of funnels—4 ft. 10 in. (2 in number).

The engines use high pressure steam, and the vessels are expected to run 13 or 14 knots per hour. The earnest principle seems to have been adopted, to the repudiation of the "*Auxiliary*," of which we have heard so much, in the design of this class of war vessels.

We repudiate auxiliary motive power on board a ship. In the exigencies of war on an enemy's coast (or in defence on one) it must be *steam or no steam, sail or no sail.* The builders and engineers engaged so arduously in preparing new and improved fleets for England, would doubtless have been gratified to have witnessed the results of *just one* campaign, to learn the utility of their labors.

[From the Journal of the Franklin Institute.]

THE STEAM FRIGATE NIAGARA.

THE respect we have for the journal in which we find the following article, alone prompts us to notice it, or admit it to our pages. The writer of the article referred to, under an assumed name, after his effort to palm off upon the public such a tissue of misrepresentations and erroneous statements, is not entitled to the respectful consideration of the periodical press; and we are greatly surprised that they are found in a journal which has heretofore commanded the respect of scientific men.

"The readers of the Journal are, no doubt, aware that this steamer is building under the exclusive direction of Mr. Steers, noted as the builder of the yacht America, who has been employed by the Secretary of the Navy for that purpose. Mr. Steers has had his own way, and if he failed in any particular, the fault will be his own. Having recently visited the vessel, I will give you my impressions in relation to her, which, I am sorry to say, are not as favorable as I could wish. She has been designed for great speed, having one-half more power than the other vessels now building, and in taking care of that point, many others of equal or greater value have been overlooked. I have no doubt she will be fast; in fact, I am quite sure of it; but her coal-bunker capacity will be about twelve days full steaming, if so much. Her capacity for stores is so much below what it should be, that her water-tanks are being constructed to fit down to the bilge, filling the space between the kelsons (which it is all essential should be left open, and arranged for easy cleaning in warm climates.) When the ship was commenced, one hundred feet was given up to the engines, boilers, and coal-bunkers, but since her internal capacity has been found so small, seven feet of this space has been taken off, which has reduced the coal capacity to a very low point for her power. On the berth-deck the officers' quarters are very roomy, and occupy a large portion of it; while the forward part, devoted to the crew, will (considering the number that occupy it) be found very small. Her gun-deck, which is also the spar-deck, will, no doubt, have sufficient room for her small armament of twelve guns. Compared with the other war steamers, she will have the advantage of speed only, and this is no advantage in an engagement, (unless it be to run away.) They carry forty guns, and at each broadside will discharge more than double the weight of shot or shell; they having two tiers of guns, and every shot would be effective in close ac-

tion, while her guns all being on her upper deck, high above the water, would often fire too high, particularly in close actions with a low vessel. To the eye externally, the Niagara is very large, but internally, she is found very small for the tonnage. This deception is owing to her rail, which deceives the eye looking without, and having but two decks, while the other vessels have three. Her draught of water will be greater than theirs, so that she can only enter a few of the harbors in the world. It has been quite the fashion for some years past to decry our naval steamers, (which are really unsurpassed by any naval steamers of the same tonnage afloat,) and the editor of one of our nautical magazines, has, in his zeal for improvement, often asserted that it was easier to make a war steamer correct, in every respect, than a private vessel, because in the former the load was known, while in the latter, it is constantly changing. If he had asserted that to a constructor, knowing what were the requirements of a war steamer, it would be easier—the remark would be a true one; but I hold that the building of war vessels is as much a profession, as the building of merchant ships; and although I have a very high respect for our private ship-builders, who have raised the character of our merchant marine to a point far above that of any other nation, yet I doubt if any of them are fully acquainted with all the requirements of a man-of-war. I am certain that the constructor of the Niagara finds many things overlooked, and hence the difficulty of finding room for all she has to carry. I do not wish to be understood as condemning the Niagara, or fully approving the other ships: both can, no doubt, be improved, and a proper medium between them be found, where capacity will not be sacrificed to speed, and where the number of guns shall exceed three, 1000 tons measurement. The other five steamers building, are, no doubt, indebted somewhat for their form to the desire of using up the timber-frames long on hand at our Navy Yards, with a fresh lot of timber to work from, six inches more head-room on the berth-deck and side-lights a little less antique, I believe our naval constructors would produce vessels creditable to the Navy, if not up to the Young America standing of everything for speed, and nothingfor capacity. FULTON."

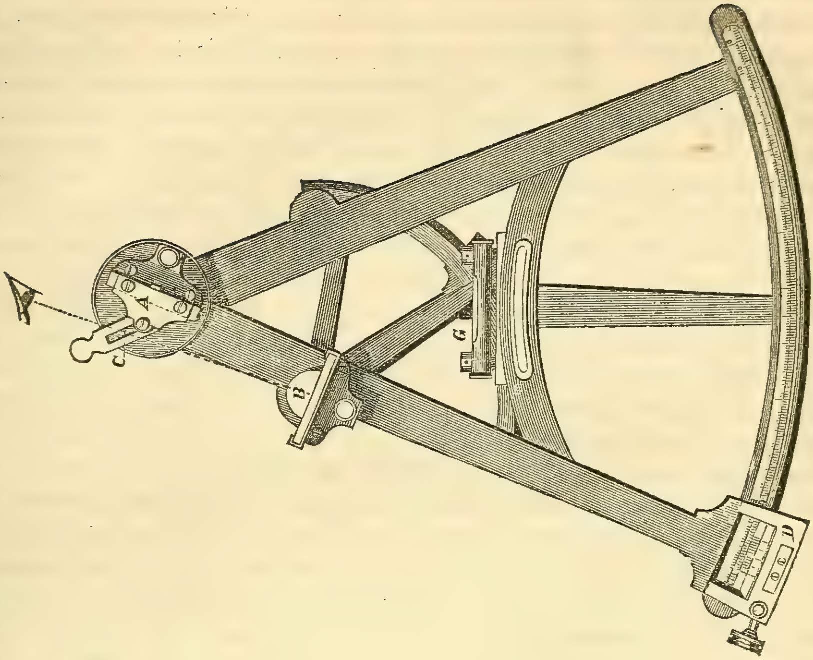
About what has Mr. Steers had his own way? He has been permitted to model and build the hull of a war steamer, *provided the model of the vessel was adapted to a certain amount of power, kind of propeller, mode of applying it, and manner of unshipping it.* What a condescension! how highly favored. These very parts with which he had nothing to do are those parts which first failed in the Merrimac. The capacity for coal and stores is abundant for the objects designed, as the writer well knows, if he knows anything about it, It is evident that he knows nothing about naval tactics, or he would have discovered other advantages in speed than that of running away. *To his eye* her external appearance is large, and her internal ap

pearance small; but as his vision was, by his own showing, deceptive, and consequently defective, he having no other medium of observation, it is not a matter of surprise that he should have ventured to expose his ignorance. As to the ship's draught of water, if the constructor is allowed to finish the vessel according to his plans, as far as may be within his province, her draught of water will be less than that of the other five vessels. In reference to ourselves, to whom the writer evidently refers, we have only to say, that whether our zeal has warped our integrity, *so far as to invalidate our testimony in relation to facts*, our readers must judge. And we may further add, that if the writer of the article in question will first find an endorser for his testimony, and will then appear at the witness box, we will prove *by himself* that it is easier to make a war steamer correct, in every respect, than a private vessel; and that private constructors or marine architects should, and do know best what type of models are most appropriate for naval purposes. If we cannot do what we propose, we will take back all we have said upon the subject, to which the writer refers. Will he act equally fair in reference to this article? If the writer knows anything of the history of the six steamers of which he writes, he must know that the models of neither have been in the least influenced by the shape, or kind of timber of which they were to be built; this has been done by private builders for the government, but never by a naval constructor. The writer is not the less at fault in reference to the number of guns which will prove the most effective per ton of vessels. By his standard, vessels built 140 years ago were the most effective, when a vessel of 600 tons carried 50 guns. In reference to the *Young American Standard* of building merchant vessels, we may add, that it may be thus defined:—to build vessels with *greater capacity, better sea qualities, with greater speed, and ligher draught of water than vessels of war.* We will remark, that we have reported both the Niagara and the Merrimac, as fast as they have progressed toward the completion of their mechanism and trial trip.

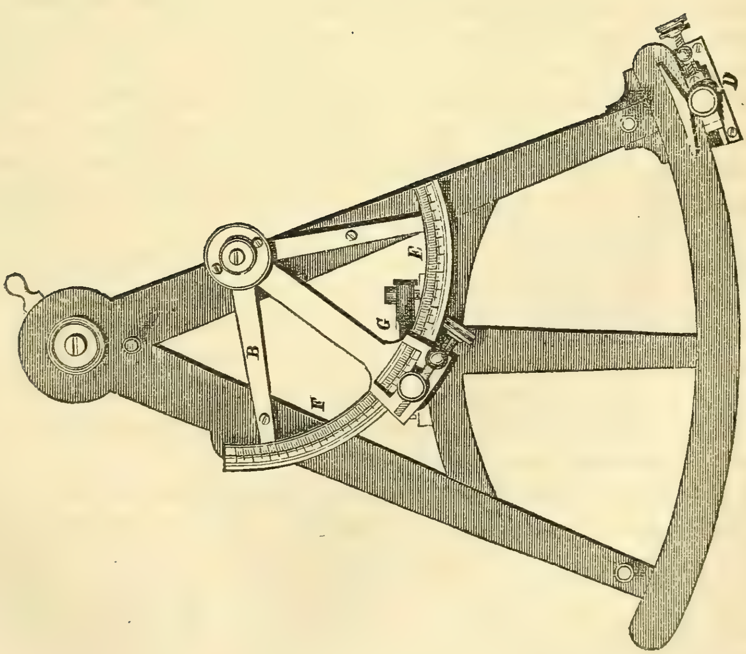
HEDGCOCK'S PATENT QUADRANT.

This instrument is worthy of the attention of the maritime interests of the United States. The following is a description, and has reference to both front and back views, as will appear by reference to the engraving.

This improved instrument consists of an index glass and bar A. C. is a detector glass, set in front of index A., for determining the longitude and also the latitude. D. the vernier scale. B. is the index glass, set in front, as the old horizon glass, differing so far as being equal to the index glass A., and placed at right angles, so that when the index A. is set to 90 deg., it forms an equilateral triangle, assuming the eye to be the apex. At the point A., the back index B. has two arcs, E. and F., extending from zero to



FRONT VIEW.



BACK VIEW.

90 deg. each way. This quadrant is so placed that it is at right angles with the front quadrant, and when adjusted, as in the ordinary method, now in use, can never alter unless the screws are altered. This is its first adjustment; the detector glass C. has a second adjustment, by which the whole secret is developed. G. is a level on the bridge for defining the nadir point, as well as for horizontal altitudes in foggy or hazy weather. The horizon glass B. being always adjusted. Set the back arc to 90 deg. E., and the altitude of the sun is taken as before. In fact, it is Hadley's Quadrant again. So that, when a clear horizon, a meridian altitude of the sun will prove how near the approximations were in foggy weather, and give confidence.

Mr. Thomas Hedgcock, Master of the Royal Navy of Great Britain, offers it to the nautical interests of the United States, with a full assurance that the improvement will be appreciated, and an opportunity given him of proving its great superiority over any instrument which has yet been submitted to the maritime world.

The patent was secured in Great Britain, on March 31st, 1855, and in the United States on the 17th of June, 1856, and claims to be an improved quadrant, which determines Latitude and *Positive* Longitude at any moment or hour of the day, without the aid of the Marine Horizon, in foggy or hazy weather, when it would be impossible to get a meridian or other altitude to work a time-keeper.

Although this quadrant will define the longitude to a mile running on a parallel of latitude, as well as the latitude north or south, yet the inventor would say to persons having chronometers, that on drawing near their port of destination their confidence will be the greater in the quadrant, seeing the check it will be to any error in the chronometer.

With this improved quadrant there is no necessity for either Nautical Almanac, Chronometer, or sight of sun, moon, or stars, except to verify the observation. The fact is, the glass C. in front of A. gives a constantly changing reflection to A. and B., the sun's image in which is always 90 degs. apart; so that the horizon, or ship or ships in running from them, sink as it were below the horizon, and so on successively, the glass C. changes them according to the distance run. By night, by a light (lantern) vertically suspended, you can determine the last verticality. Say, when off Sandy-Hook, the detector glass C. is at right angles, as seen in B., looking under A. direct at the lights; if you run 45 degs. east, you must heave back 45 degs. on arc A., to have the positive object seen, and reflection of a light on board, the same as leaving port.

This quadrant defines the rotundity of the earth, the ship positively carrying her own distance, and the detector glass C. so constantly changing the reflection, defines positively the miles the ship may have run.

This, the inventor asserts, is the discovery of true longitude, and with the utmost confidence he seeks the introduction of his discovery and the cooperation of the maritime interests, who are to be so much benefited by the

discovery, to enable him to prove the correctness of his instrument, by appointing some sound practical navigator to proceed with him on one or more voyages, that he may have an opportunity to dispel all doubt as to the simplicity and infallibility of its working; and he feels quite certain of being able to prove the beautiful precision of its working to the most sceptical.

The instrument may be seen at the office of T. B. Robertson, 120 Water-street, N. Y., who will make arrangements with any party who may wish an interview with the patentee.

STANDARD OF SPEED FOR LINE-OF-BATTLE SCREW-SHIPS IN ENGLAND.

In these times of experimenting in naval steamers, by the government of the United States, it may be profitable to note the altitude of engineering skill attained by our English friends. We have been informed, by one who values his opinion, that we "expect too much of our naval vessels;" we ask our friends to become posted upon such facts as the following, as conveying a part of our answer.

Let the people of this country inquire whether the men of *moderate* anticipations, tame resolve, and conservative views, in ship-building, give utterance to the aspirations of true genius, with a heart behind it, or only repeat the dotings of a feeble mind, when they profess to be satisfied with the result of a half-endeavor in naval operations?

On the 20th May, 1856, Mr. Andrew Murray, Chief Engineer of the Steam Establishment in Portsmouth Dock-yard, went out to direct the trial of the machinery of the *Marlborough*, new screw *three-decker*, 131 guns, 4,000 tons, and Mr. Shirrof, manager of the firm of Maudslay & Field, went to note the result for the contractors. The engines are horizontal, having two cylinders 82 inches diameter, with 4 feet stroke; they have six boilers and 24 furnaces; the tube surface of the boilers is 17 ft. per H. P.; her screw is 9 ft. diameter, and 26 ft. 6 inches pitch. The engines made fifty one and a half and fifty two revolutions, with a pressure "of 20 lbs. of steam. Her nominal H. P. is 800, but she worked up to 2,700. The weight of the machinery is about 600 tons. We are glad to say the trial was very satisfactory. Mr. Murray also made a trial of her speed, at the measured mile, in Stoke's Bay. In spite of the high wind she made the first run in 5 min. 1 sec., giving a speed of 11.960 knots, with the tide; the second run gave 10 knots, against the tide; the third run gave 12.162 knots, with the tide; and the fourth run gave 9.917 knots, against the tide—the mean average of the four runs realizing 11.060 knots per hour. When properly trimmed, and under fair wind and weather, her speed will average from 11½ to 12 knots per hour."—*London Artizan.*

We think it is likely there is a mistake in the size of the screw—it is set down at 9 ft.—perhaps it should be read 19.—*Eds. U. S. N. M. & N. J.*

THE EASTERN STEAM NAVIGATION COMPANY'S GREAT SHIP.

[WITH this number we present our readers with the first of a series of articles illustrated by plates, exhibiting the particulars involved in the construction and equipment of the greatest maritime wonder of the age—the British Eastern Steamship Navigation Company's great iron ship, building at London. For this entertaining information we shall be indebted to the *London Artizan*. Perhaps the statement that this colossal vessel may visit the United States on her *trial trip*, will render these articles of very great interest to mercantile men, inasmuch as we calculate the *Persia* will yield her laurels to the *Adriatic*, and it will again be England's turn to lead the ocean course—perhaps with her steam driven iron ark.]

For several months past we have been preparing a series of Plates of the great ship and its machinery, and with the present number we give the first of the series. Plate lxxiv. is a transverse section of the after part of the hull of the great ship, exhibiting the peculiarity of her construction, and showing accurately a side view of the engines and machinery for driving the screw propeller, the scale being $\frac{1}{8}$-inch to 1 foot.

These immense and splendid specimens of marine engineering have been designed and constructed by Messrs. James Watt & Co., of Soho, near Birmingham. The following are the principal dimensions of the engines, boilers, screw propeller, &c., as furnished to us by the manufacturers. We have to observe that the drawings have been made by us from the detached details and working drawings of the engines, boilers and machinery, and the accuracy thereof may be relied upon. As to the details of the vessel and the peculiarities of her internal arrangements, we shall hereafter give accurate particulars.

There are four cylinders, 84 in. diameter by 4 ft. stroke, and the ordinary speed is to be 45 strokes per minute, at which the nominal power is 1,700 H. P.; but at 50 strokes per minute, and at which the engines will go with steam of 25 lbs. pressure, the power will be quite 2,000 H. P. The weight of the engines alone is about 500 tons.

There are to be three sets of boilers to work the screw engines, each set having a surface of 8,500 sq. ft, say 1,680 brass tubes 3 in. diameter outside, and 5 ft. 6 in. long. The grate surface is 406 ft. The weight of each set is 190 tons, including 90 tons of water.

The screw is 24 ft. diameter, and 37 ft. pitch; the propeller shaft is 24 in. in diameter, and 48 ft. long, and weighs 35 tons. There is an ingenious arrangement by which the after screw bearing may be cottered up and adjusted at pleasure. This is effected by a separate chamber—in fact a "diving-bell"—and from which the air is expelled in the usual manner by pumps, thus allowing an engineer to descend and do what is necessary. This is shown in the longitudinal section (plate No. 2 of the series), which will be given in our next.

The velocity of this ship was never intended to be of the highest class, because the possession of capacity for storing sufficient fuel on board for a voyage to Australia and back, gives a great advantage in making a *direct* passage without stoppage of any kind usual with other ships of less capacity, and that therefore a less *average* velocity would answer all calculated purposes. Supposing, therefore, the draught of this ship to be (when loaded and ready for sea) 28 ft., the area of the midship section will be 2,000 ft.; and if we infer that the *actual* power exerted by the combined engines will be equal to 10,000 H. P., and further supposing the power to increase as the cube of the velocities, we find, from experience in practice, the velocity under such circumstances will be 17 statute miles per hour. By the same rule we find the paddle engines will give the ship a velocity of 12.55 statute miles per hour, and the screw engines alone will give a velocity of 14 statute miles per hour.

But this supposes no *drag* to take place from the immersion of paddle wheels in the one case and of the screw in the other. To obviate the retention arising therefrom, it is arranged so that the paddle-wheels may be easily detached from the engines, and be allowed to revolve freely in the water.

In the case of the screw, perhaps a more complete scheme has been devised for this purpose.

Two engines, each of 20 H. P. are to be fitted, and which can readily be attached and detached from the screw-shaft at pleasure, a self-acting clutch is also to be fitted to the large screw engines, by which they can be readily disconnected from the screw-shaft. It will then become the duty of the small engines to work the screw at a reduced velocity equal to that given to the ship by the paddle engines *alone*. As a recapitulation of the various steam power to be employed in this gigantic work, we may observe that in all there will be on board no less than twenty-two engines of various powers.

Say, the four engines for working the screw of	1,700 H. P.
Four ditto, ditto, paddle wheel	1,350 H. P.
Two engines for working the capstan, getting up anchors, and pumping out ship, &c.,	60 H. P.
Two engines for working screw alone, having separate boilers and services,	40 H. P.
Ten donkey engines for filling up boilers, not to be used for other purposes, and each engine of about 10 H. P.	100 H. P.
Total	3,250 H. P.

In all 22 engines of the aggregate power of 3,250 H. P

The large screw engine will be fitted with a separate steam cylinder, by which it is presumed these large masses can be started and reversed with the greatest ease and certainty.

In presenting our readers with a series of plates of so interesting a work, we propose, in the course of the present and following numbers of *The Artizan*, to give a sketch of the origin and progress of the undertaking, as we feel that it is due to the talented designer of this bold experiment in, and gigantic specimen of, naval architecture, as also to those connected with him in practically working out the great problem to be solved, as also to those who, aiding and assisting the undertaking commercially, thus enable the engineering talent of this country to maintain its supremacy over the combined skill and talent of the whole world.

Originality of conception, boldness of design, and combined with the consideration and accurate arrangement of practical details, are but seldom combined in one man; but the name of Brunel has been so often associated with things original, bold, and practical in science, that whether we look to the great works of the father, or the more modern, and, perhaps, more commercial achievements of the son, we must confess to the feeling that whatever money can be provided for, the original mind, talent, enterprise, skill, and practical ability of a Brunel can unfailingly work out, however bold and problematical such schemes may at first sight appear.

To Mr. Isambard Kingdom Brunel is due the credit of originating the bold design of which we have undertaken to give our readers a general description, illustrated by a series of expensive copper-plate engravings. It is now twenty years since Mr. Brunel's first Transatlantic steam ship, the *Great Western*, was designed. It was thought at the time a bold stride to increase the dimensions of that ship by 50 ft. in length and about 8 ft. in breadth over the largest paddle-wheel steamer then afloat, but the prophesied fate of the *Great Western* was proved to be unfounded and untrue upon her first voyage; and we have seen the progressive increase in the dimensions of our steamships which has gone on during the last few years. The giant of 1838 has become the pigmy in 1856. Omitting the Great Eastern ship, we can compare the *Great Western*, 236 ft. × 35 ft. 6 in., with the *Great Britain*, 322 ft. × 51 ft.; the *Himalaya*, 370 ft. × 43 ft. 6 in., and, lastly, the *Persia*, 390 ft. × 45 ft. But beyond these Mr. Brunel's ship shoots far ahead, being laid down at 680 ft. × 83 ft.

Mr. Brunel seems to have determined to settle the question of whether or not steamships are to maintain their well-earned superiority over clipper sailing ships when employed upon world-round voyages, as they have heretofore done on Atlantic, Mediterranean, and other voyages of similar extent. And in looking about for the cause of the failure of the steamers employed in the Australian route to make such voyages in less time than clipper sailing ships or vessels fitted with auxiliary steam power, and also to make such voyages commercially profitable, he saw that the views he held twenty years ago with reference to the Atlantic trade were applicable, in an eminent degree, to India and Australian voyaging, *via* the Cape, and determined to in-

crease the carrying capacity for *fuel* to such an extent, as to make his new ship independent of supplies to be derived from coaling depots during her voyage, to which coaling stations the fuel has to be sent by many ships at a vastly increased cost per ton, and is much damaged by the transhipments and breaking of bulk necessary under such circumstances. The estimated quantity of 5,000 to 6,000 tons of coal necessary for the voyage out and home involved other increases of dimensions, calling in turn for the proper proportioning of strength or power to suit these new conditions of things, and admirably does Mr. Brunel appear to have considered the every detail and bearing of the question. And we look forward to the time when the successful launching of this monster ship will be but the first of a series of triumphs for this great work; and we sincerely hope we shall be one of the first voyagers invited to give the world the best proof of their entire confidence in the skill and talent of the designer—in the excellence of the workmanship and materials of the contractors—in the perfect safety of the ship at sea—and in the success of the experiment in a practical and scientific point of view.

In our next we shall give, in continuation, a sketch of the progress of the work, and our second plate will exhibit a plan of that portion of the ship containing the engines, boilers, and machinery for driving the screw-propeller. Of the details of these engines we intend hereafter to give a minute description, possessing, as they do, many features of interest and novelty, and eminently creditable as they are to the celebrated firm of James Watt & Co., by whom they were designed and manufactured.

In our second plate of this series every dimension is accurately figured upon each part.

[From the United Service Magazine.]

THE BRAZILIAN NAVY.

WHAT is the use of a small navy? What advantage can accrue to a state that possesses one old corvette, two brigs, and a steamer, to float in strange harbors, with a strange flag at their peaks, and to imitate, on a small scale, the habits of the French and English men-of-war? Take the example of Greece, which possesses one steamer; or take the example of Brazil, whose Navy is somewhat more extensive, but not, as a whole, much more important. If we may trust a list of the Brazilian Navy, given us by a French author, M. Charles Reybaud, that State possesses two frigates, seven corvettes, eight brigs and brigantines, seventeen schooners and yachts, one steamer of 300 horse-power, two of 220, two of 150, four of 130, one of 90, two of 70, one of 40, two of 25.

Brazil is a commercial country, but we do not suppose that its Navy is to be considered at all in the light of a protector of commerce. If any protection was needed, there are always English men-of-war at hand, ready to perform any service that may be required. Certainly, since the Brazilian Government took an anti-slavery line, their Navy was of some use in cruising off the coast, and boarding vessels suspected of engaging in the African traffic.

Once or twice, slaves were seized by Brazilian men-of-war, and, we believe, some which might escape the vigilance of our own cruisers, fell a prey to the insignificant steamers and brigantines on which the English looked with such unaffected contempt. But the success of Brazilian cruisers was small, and their effect on the slave trade by no means to be compared to that produced by governors of places where slaves once landed. We have shown, on a previous occasion, how the Brazilians effected the almost total suppression of the importation of negroes, and very little credit belongs to their Navy for its exertion in that service.

During the Monte-Videan disturbances, although no naval actions took place, the Brazilian men-of-war were of some use in conveying troops from Rio Janeiro to the scene of action. But this duty might have been discharged by merchant vessels, with equal or greater celerity. We are still unable to perceive the exact need of a Brazilian Navy.

We perceive, by the list given us by Mr. Reybaud, that the two-decker which once belonged to the Brazilians, is no longer in existence. The two-decker was named the *Don Pedro Segundo*. She was built at Balua by Brazilian artificers, and sailed thence to Rio Janeiro.

On her passage she rolled so dreadfully that her masts went by the board, and this accident induced the Brazilian Government to abstain from sending her on another cruise. She was sold for the purpose of being broken up two years ago. After the said two-decker, the finest vessel belonging to Brazil is the frigate *Constitution*, which will be recognized by the English (under the name of the *Constitution*) as an American frigate, which distinguished itself during the American War, by capturing with great difficulty the *Java*, an English jackass frigate, of about half the size of the *Constitution*.* The Brazilians purchased this frigate of the Americans, and were taken in, as one reasonably might have expected. They paid a large sum, supposing her to be copper bottomed; but when she was dry-docked in England, the Brazilians not possessing a dry-dock of sufficient dimensions, it was discovered that a slip of copper was nailed round her just about the water-line, so as to convey the impression that she was completely coppered.†

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* How great the difficulty was may be seen from Cooper's Naval History: Constitution, 44 guns, 9 killed, 25 wounded; Java, 38 guns, 60 killed, 101 wounded.

† We think the whole story has not been told, inasmuch as it is the universal practice to examine vessels before purchasing them, rather than afterward, as the writer asserts. If the copper was new, why did they examine her bottom after being sold? If the copper was old, it is sufficient,

Such is the origin of the finest vessel in the Brazilian service. Few of the corvettes or brigantines have any pedigree to boast of. One or two of the most beautiful schooners have been captured with slaves on board, and converted into men-of-war. Yonder graceful yacht, with the pendant at her mainmast, and the green ensign at the peak, was a notorious slaver, after whom cruisers of every kind toiled in vain. She was captured during a calm by a contemptible little steamer of 25 horse power.

Having given a list of the Brazilian Navy, and noticed the most prominent vessels, it remains for us to chronicle its achievements.

What has the Brazilian Navy done? Has it gained any victories? or have any remarkable actions between single ships graced its records? With difficulty we have discovered one encounter, whose importance entitles it to a prominent place in the future annals of the State. An English brigantine was once cruising in search of slavers, when a suspicious-looking schooner hove in sight. The brigantine gave chase, and, as the schooner paid no attention to her presence, fired a gun, unshotted of course. On this the schooner hoisted the Brazilian ensign, and a pendant at her mast-head, and the brigantine, satisfied, hove to. Immediately the schooner hauled up, and fired at the brigantine, and then bore up and made all sail to escape any punishment for this insult. Of course the brigantine declined to end the matter thus, and went in chase again, firing at the schooner with shot and shell, ten of which brought her to a state of submission. Two officers were sent from the brigantine on board the schooner, to demand some apology or explanation. The captain of the Brazilian schooner apologized humbly, and offered the two officers a glass of ale as a compensation!

A history of the Brazilian Navy would not be complete without a sketch of one of its vessels. We will, therefore, select a corvette for this honor. A recent traveller has given this description of a corvette, named the *Bertioga*:

"I had the pleasure of paying her a visit, and found a strong resemblance between her and a Newcastle collier. She was very 'slummy,' (naval term for slovenly) and dirty. Aloft she seemed excessively untidy: ropes' ends flying about, sails badly furled, yards not squared, and ropes not taut. Some men were aloft looking very uncomfortable, hanging to the slack ropes, that waved and swung about at each roll, with more than landsman-like tenacity. I entered into a conversation with an officer on board, who spoke a little French, and found that the *Bertioga* had that morning taken some slaves,

evidence that it was not prepared for the occasion. The copper might have been put on above water, as it is now often done, before going into dock, in order to facilitate the work. The story bears all the features of fabrication.

Does the editor of the Journal envy the success attendant upon American genius in maritime construction?—or does he think nautical men are not capable of judging for themselves of the value of a superior article in the line of their profession? It is dangerous to handle edge tools, until we have learned how to use them.—[*Eds. U. S. Naut. Mag. and Naval Journal.*

who were visible on the main deck, men and women together, in a state of nudity. The crew of the *Bertioga* consisted chiefly of Brazilians and negroes. I saw, also, one or two Englishmen on board, who seemed heartily ashamed of their ship, and sneaked about in a pitiful manner, as if the fact of belonging to a Brizilian man-of-war had robbed them of all their courage. The boatswain, a fierce man, out of uniform, dressed in a sort of linsey-woolsey frock, roamed about the deck with a rope's end in his hand, applying it freely and indiscriminately. The officer with whom I was talking informed me that the corvette had on each side eight 24-pounder guns, and one of 32 pounds, 18 in all."

Such is the history of the Brazilian Navy.—[*From an English Journal.*

NAVAL GUNNERY.

THE following extracts from Sir Howard Douglas' Treatise on Naval Gunnery, we find in the American edition of the London Quarterly Review:

"Contemporaneously with the remarkable tendency to an increase of size in our merchant vessels, the thoughts of scientific men have been turned in an opposite direction with respect to vessels of war. As we stand on the deck of the 'Great Eastern,' and look across to Deptford, we see riding at anchor one of that famous fleet of gun-boats, called forth by exigencies of Baltic warfare. She is scarcely bigger than the screw-boats which the vessel under our feet will carry on each side of her paddle-boxes. The idea of any number of such little Davids attacking Goliath would appear to be preposterous. An examination of the subject, however, makes it seem probable that in fighting ships size is a great element of danger, and diminutiveness of safety. The massacre of Sinope—the first blow of the present war—gave us evidence of the effects of a new order of projectile, which will, in the opinion of those versed in gunnery, very much modify our ideas with respect to building such enormous men-of-war as we have done lately. Sir Howard Douglas, in his admirable work on the 'Art of Naval Gunnery,' takes this view of the case, in the most decided manner, and quotes with applause a letter from General Paixhan, published in the 'Moniteur' of February, 1854, entitled, 'Observations on the burning of the Turkish Frigates by the Russian Fleet in the Black sea.' From the report of the Russian admiral, the writer shows that the almost instant destruction of the frigates of our ally, was caused by Paixhan shells fired from the Paixhan guns, on the lower decks of the Russian ships. These shells, according to the Turkish official report, first 'set fire to the ships, and then blew them up.' Arguing from the proved destructiveness of these projectiles, the inventor of them draws the following conclusions:

"Guns which fire shells horizontally will destroy any vessel, and will do this with a greater certainty, in proportion as the vessels are large; because the circulation of powder and projectiles during an action being more multiplied for the service of a greater number of these guns, will multiply the chances of an entire explosion of the ship. From this fact results the important question, whether, instead of concentrating in a single ship of 80 or 130 guns, and 1000 men, and exposing that large quantity of military and financial power, and that amount of lives, to perish suddenly, it would not be better, from motives of humanity and considerations of economy, to lay out the same sums of money in constructing two or three much smaller vessels, which might together carry the same amount of armament and the same number of men? Our principal ships being then far less enormous, and drawing less water, may enter a greater number of our ports, which at present are limited to five, accessible to large ships. The construction of three smaller vessels would neither require so much time nor timber, nor be so costly. Our fleets would then find at home, and in our colonies, more ports of refuge accessible to them; and they would find more points accessible to attack on the coasts of the enemy. The battery of a frigate may, as well as the battery of a large ship, carry the means of keeping at a distance, or of destroying an enemy, in the combat of two or three such ships against one adversary of colossal magnitude; the latter may doubtless, if near, be able to destroy either of the others singly; but these might concentrate upon him at a distance mortal blows, and remain masters of a field of battle, from which the greater ship will have disappeared. With an arm, the effect of which is very destructive, the advantage will evidently be in favor of those who know best how to give it length of range and accuracy; thus, both in our actual armaments and in the progress to be made, these two conditions, together with the superiority of calibre, should above all others be satisfied; to this I shall add, that if the same effects would be produced by lighter pieces of artillery of the same description, which do not require vessels of such great draught of water, nor expose so many men, we should have resolved a problem which, together with great speed in our steamers, and greater numbers of them, would give to France a system of naval economy which suits her in the highest degree."

"May we not carry General Paixhan's idea of a subdivision of force still farther, and ask whether a cloud of swift and powerful gun-boats would not often be still more effective than large frigates? Let us imagine even the 'Duke of Wellington,' of 131 guns, attacked by a score of these Cossacks of the sea, each armed with 68-pounders, placed fore and aft, firing Paixhan shells, would she not be very much in the position of a parish-beadle stoned by a mob of mischievous boys? A broadside such as hers, towering high above the water, would present a target which it would be difficult to miss; whilst she would have as little chance of shooting swallows with her long

guns as these nimble gun-boats, for ever warily keeping their sterns on, at a respectful distance, and presenting a mark not more than twenty-two feet to her gunners. The difficulty of hitting such mere specks would be immense; and even the turning of these minnows on the water would expose them to little harm, as the experience of the attack on Sweaborg proved; for the gun-boats which kept moving about on that occasion were never once struck."

If this view is correct, and the concentrated fire of a few gun-boats is likely to overpower the radiating fire of three-deckers; and if the dire effects of a single shell bursting on a ship's side be, indeed, so great as General Paixhan affirms, it may be that the necessity of building a peculiar class of vessels for shallow seas will open our eyes to the glaring mistake we have committed in building such enormous ships of war. It is a maxim among military engineers, that no fortification is stronger than its weakest place. Now, if a Paixhan shell, striking a three-decker near the water-line, and exploding in the side, as it is most likely to do, from its extreme thickness, is capable of smashing the timbers for many feet around it, her very size and weight will only the more speedily cause her to disappear under the water. The tremendous batteries of such a ship would have but little effect upon these boats, which, by the use of Lancaster guns, could fight at 4,000 yards distance, at which range they would not appear to the huge liner much bigger than floating tubs; whilst they would be able to destroy their big antagonist with as much certainty as Gordon Cumming brought down an elephant at his leisure with his resistless 'Purdy.'

The four divisions of gun-boats, now collecting in the Channel, are living proofs of the energy of our private enterprise, and of the strength which England is capable of putting forth at the shortest notice. Of the 200 gun-boats, more or less, which are now, like dogs of war, straining at the leash off Mother Bank, more than two-thirds were not even laid down three months ago. Not an engine had been wrought out of the shapeless mass of iron; not a boiler of the ten score which now lace the leaden sky with their thin, white wreaths of steam, had been put together.

If we can be proud of anything during the *late* war, beside the gallantry of soldiers and the magnificence of our transport system, it must be of our manufacturing energy, which has created a host of armed ships, moved by complicated machinery, almost as quickly as Cadmus created legions of armed men out of the ground. No other nation could by any possibility have accomplished the same task, for the simple reason that they have neither the tools nor the skill to direct them. The Messrs. Penn, of Greenwich, for instance, received an order three months since, to complete by the beginning of April, eighty marine engines of sixty horse-power each; the entire moving power, in short, of nearly half the mosquito fleet. If such an order had been given to any continental engineer, he would have treated it as a joke; but the Messrs. Penn have not only completed it within the specified time, but have put them in working order on board the fleet. Of course,

so enormous a task could not have been accomplished by one house. A pattern engine once agreed upon, the contracting firm sent duplicate patterns to all the principal engineers throughout the island, ordering so many different portions to be delivered on a certain day. In this manner the whole force of the country was put upon the work; and cylinders, connecting-beams, stuffing-boxes, piston-rods, &c., from a dozen different factories, have been steaming for weeks past across the island, towards the Messrs. Penn's fitting shops, where they met and were put together for the first time. The major portion of the gun-boats themselves have been furnished by the private ship-yards. From half-a-dozen points of the Thames, these handy little craft, sometimes in twos and threes, ready rigged and with engines on board, took the water during the last six weeks. At Liverpool, Bristol, Newcastle, Sunderland, Northam, Southampton, and Cowes, this tiny fleet has been fashioned through the long winter nights, by the light of gas twinkling between their ribs. Although, in outward appearance, the boats are all precisely alike, their tonnage, draught, and propelling powers, are widely different, as we see in the following table:

	No.	Tons.	Draught of Water [Light].		Horse Power.	Speed.
			ft.	in.		Knots.
Snapper Class . . .	123	233	5	4	60	9½
——— Class . . .	3	232	4	10	40	8¼
Cheerful Class . . .	20	212	4	3	20	7
Dispatch Boats:—						
Flying-Fish Class . .	3	868	from 9½ to 12 feet		350	about 13 knots.
Wrangler Class . . .	6	477			160	
Vigilant Class . . .	14	667			200	
Mohawk Class . . .	2	267			80	

These vessels, together with those already in commission, which had service in the Sea of Azoff and Baltic last season, bring this stinging little cloud of mosquitoes up to the round number of two hundred, mentioned by Sir Charles Wood, in his speech in the House of Commons.

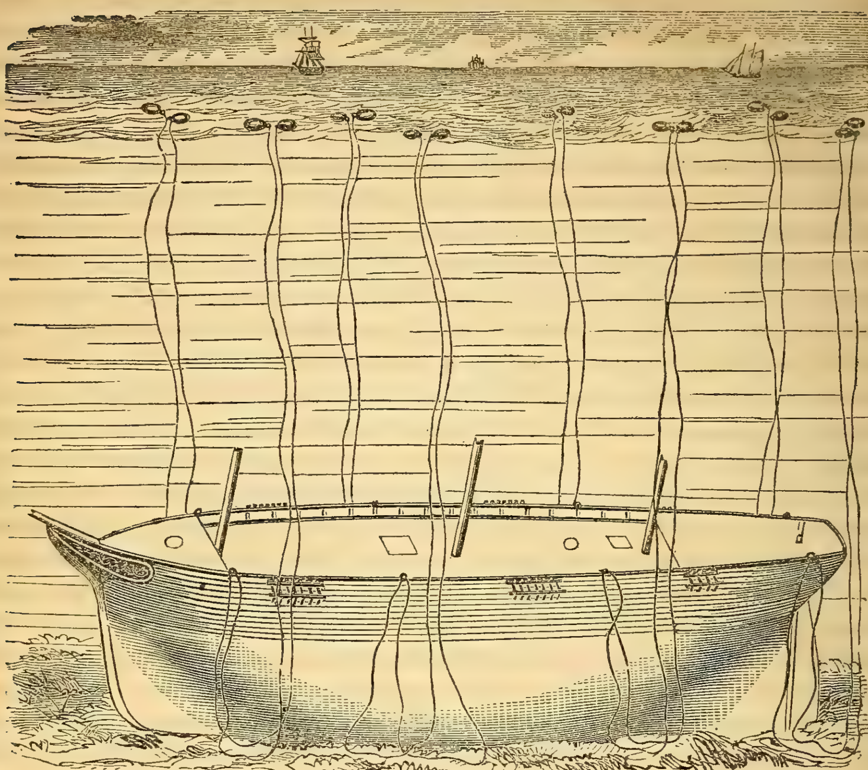
The armament of all the gun-boats is alike, namely, two 68-pounders, made to fight fore and aft, with pivots to fire broadside if required. When not in action, the guns, of 96 hundred weight each, are housed in the middle of the deck. Each vessel will be a separate command, and the whole will be formed into four squadrons. The ships of the line, in which the commanders of the squadrons will hoist their flags, will serve as nursing-mothers to this light artillery of the sea, which will scour the ocean on every side, returning ever and anon to the parent ship, as chickens return to the maternal wing, for warmth and support, in the shape of coals, food, and ammunition. The great diversity of power, and the difference of draught in these vessels, varying as they do from 20 to 350 horses, and from 5 to 12

feet of water, will make them free of the shallows and inlets of any sea in which their services may be required. Against this ubiquitous and resistless force the Russians had, in the early portion of the year, nothing but row-boats to oppose: and we heard with wonder that the crews of these inefficient crafts were armed with lances, and with a curious kind of mace studded with spikes, such as the Scandinavians used when the heroes of the Niebelungenlied were in the flesh. The dispatch boats differ materially from the gun-boats, inasmuch as they are built of iron, with very fine lines, and are designed for speed as well as for fighting; hence they are classed as the light squadron. The swiftest of them are capable of running fifteen miles an hour, and are armed with two Lancaster guns and four 68-pounders, and are not much smaller than the old 36-gun frigates of the last war. In 1850, Messrs. Laird, of Liverpool, and Mr. Scott Russell, of Blackwall, built powerful iron vessels, of a light draught, for the Russian and Prussian governments. Their capabilities were reported upon to the Admiralty before they left this country; nevertheless, the war found us entirely destitute, and we entered the Baltic with our huge liners, which were about as well adapted to the shallow waters of that sea as the lifeguards would be to pursue Caffres in the bush. The whole country has witnessed, with mingled feelings of shame and indignation, the paltry attempts of Sir James Graham to throw upon the shoulders of Sir Charles Napier the whole blame of our ignoble promenade in the Baltic in the year 1854. What better could he have done with the means at his command? And whose fault was it that he had no better means? As early as the month of May in that year, the attention of the Admiralty was drawn by Captain Claxton to the fact that Mr. Scott Russell would engage to turn out of hand any number of light-draught gun-boats in ten weeks from the date of the order. That offer was disgracefully refused, on the plea that iron was not approved of as a ship-building material! Why, as a naval authority has well observed, they should have built paper boats, if they could have managed to bring our long range guns and mortars to bear upon the fortresses of the enemy. Dispatch was the one thing needful. Had Sir James Graham closed with Mr. Scott Russell's proposition, Sir Charles Napier would have got the weapons he wanted, and would not, we predict, have come 'bootless home and weather-beaten back, from the campaign of 1854. If there was such an insuperable objection to iron vessels, why, we ask, did Sir James Graham exchange the 'Thetis' frigate with the Prussian government for the gun-boats 'Nix' and 'Salamander,' both of this obnoxious material? Early in 18'5, the Aberdeen Admiralty was partially forced out of its disgraceful inactivity, by the loud calls of the public press for gun-boats; and in order to quiet the storm, one of its members stated in the House of Commons that several had at last been laid down.

When the first was launched, in the summer of 1855, it was found to draw twelve feet of water—a draught which would render it as incapable of run-

ning up the shallows of the Baltic, as a camel would be of going through the eye of a needle. By the autumn of the same year, the Admiralty managed to build sixteen gun-boats of a more suitable size, and sixteen old dockyard lighters were fitted up as mortar-vessels, and sent out to Admiral Dundas. With these, together with the aid of a few mortars and light steamers furnished by the French, the vast stores contained in the arsenal of Sweaborg, together with the greater part of the town and naval buildings, were destroyed. We have only to learn the performance of this insignificant and hastily-fitted force to read the utter condemnation of Sir James Graham's Admiralty. The mortar-boats, moored at 3,700 yards distance, with 400 fathom of cable to veer upon in case the enemy should get their range threw 3,099 13-inch shells into the Russian stronghold, each shell falling with a force of 75 tons; whilst the sixteen gun-boats, at 300 yards, with perfect impunity to themselves, threw into the arsenal 11,200 shot and shell. Under such an infernal rain of iron as our own and the French vessels projected, no wonder that the whole place on the second day was one vast sheet of fire. If with such a limited force we managed to deal such a disastrous blow to the enemy, what might we not have done with the fleet of gun-boats now collected together, in addition to the eighty odd mortar vessels, mostly constructed, by-the-by, of iron? We venture to say that neither Revel nor Cronstadt would have reared their granite fronts above the water twelve hours after they had been bombarded by such a force. We will go further, and assert, with little fear of contradiction, that if a score of these gun-boats had entered, in the autumn of 1854, the Sea of Azoff, the Russian army would not have been able to have maintained itself in the Crimea through the ensuing winter; and, as a consequence, the flower of our army would have escaped destruction. The first great blow aimed at the power of the enemy was dealt by Captain Lyons; and the most successful of his little fleet was the gun-boat 'Recruit,' alias the 'Nix,' which the Prussians had built on the Thames, as a pattern for us to go by as early as 1850; and was the identical vessel pointed out by Captain Claxton as an example to be followed in May, 1854. This admirable iron boat destroyed all the military stores of Taganrog, at 1,400 yards distance, without the slightest injury to herself. Why, we ask, was this pattern vessel neglected for four years, at a time when all the world knew that by such vessels only, the naval warfare we were engaged in could be carried on? Posterity will sternly ask this question; and Sir James Graham will not be considered to have answered it by his miserable *tu quoque* arguments against a blustering old Admiral. Now, it is too late and the horse is stolen, an admirably constructed lock is placed upon the stable-door; now that the just war we have been waging has been strangled by diplomacy, the Channel is covered with a flying artillery, which is paraded before the eyes of Europe—just in time to fire a salute in honor of the proclamation of peace!

THE WRECK FINDER.



We are glad to learn that the unparalleled and fearfully long list of disasters within the past year, has awakened the dormant energies of inventive genius, to save foundering vessels from being a total loss, unless sunk in the open sea, and even there, the means for recovery would be effectual if they should be discovered. Every feasible appliance which has a tendency to mitigate the loss of life or property, should meet with favor at the hands of a commercial community; and none are more deeply interested in the matter, than the nautical men of this city, in attaching to vessels an appliance which, in case of foundering, at once not only indicates the locality of the vessel, but furnishes the means of restoring her to the purposes of utility, without resorting to those expensive and tedious means, which have been and still continue to be used. Our convictions were enlisted to this subject, on examining an invention of Mr. Joseph Hyde, of Troy, N. Y., for finding sunken vessels, whether wrecked or otherwise. Its simplicity and cheapness commends its adoption to the notice of ship-owners, and its fostering notice by underwriters. By simply attaching from four to eight holding iron plates to the sides of the

vessel, at those parts farthest removed from the entangling influences of the rigging, to these eyeleted plates, straps or rods, the eyes of which project above the rail, or indeed, the head of the bulwark-stanchion may serve equally well, a cord or copper wire is attached at the middle of its length, the ends of which have India balls attached to them. These balls or buoys may lie upon the rail with a small box over them, and the coil of cord or wire. As soon as the vessel sinks, these buoys find their way to the surface, and when ready to raise the vessel, by disconnecting the wire from one of the buoys and attaching it to a chain of sufficient strength, the other end of the wire may be drawn up as the chain is payed out, when the end of the chain may be drawn through the eye up to the surface, and the two parts buoyed at the surface until all the floats are arranged in the same manner, when the vessel may be raised without difficulty. When the chains are selected and ready for application, it is but the work of an hour to reeve them. How different this operation from the ordinary mode, even after the vessel's location is known; the vessel must be swept with chains, which is a difficult job, and expensive at best, and not always practicable. Here is an appliance always at hand in the hour of need, occupying no available space in the vessel, both simple and reliable, and at a cost, scarcely worthy of mention, when contrasted with its benefit —perhaps less than one hundred dollars for the largest vessel. We are flooded with inventions to save the crew and passengers, or to save the treasure if there be any on board, three-quarters of which are scarcely worthy of notice. But here is one of the simplest arrangements that can be devised for finding and saving the ship after the passengers and crew have abandoned her. We think it would be well for ship-masters and underwriters to examine the merits of the wreck-finder, and add another appliance for the safety of the ship by attaching it to their vessel. Any information in reference to the invention, will be furnished at the office of the Magazine.

RULES OF ART, AND RULES OF THUMB.

It has always been regarded as one of the most essential features in mechanism, to be able to arrange the proportions of any piece of work in such manner, that they may be reapplied without difficulty by the same process, and in the same manner. While this has been the desirable end to be attained, it has been regarded of no less consequence to make individual rules, that would approximate or determine the same results, without having recourse to the generally received practice. It has been the custom of men of science to improve those general principles of construction for the benefit of all; and to demonstrate the truthfulness of their investigations, they have left the problem and its solution to be examined by all who may be interested, to be approved if found correct. These investigations have been extended

into all departments of mechanical knowledge, so that all may profit. If a perpendicular is to be raised, whether on the draft board, or on the floor at full-size, the rule of art or science is at hand to assist us, and we have recourse to the elementary principles in practical geometry, with the dividers on the board, or by the number of degrees on the circle, or by the ordinary six, eight, and ten feet rule on the floor; if an abutment or a buttress is to be raised, those familiar rules in practical geometry are at hand, to assist the operative mechanic; but all these are rules of art, approved and corrected by science, and are therefore reliable—their truthfulness having been tested by the structures themselves, where a single error of the smallest magnitude would have destroyed the fabric. The principles of science have so fully demonstrated the stability of their foundation, in the laws of nature, that look where we may, we see discoverable traces of those immutable laws developed by the principles of geometry. There is no such thing as *science* without the application of those principles. How soon does the power of water sweep away the bulwark that dams up the rising flood, if the principles of geometry have not been applied at its base, and throughout the structure! How many times the mechanical world have been punished by neglecting to obey those laws, by the sweeping away in a single hour the work of years! What but a conformity to those very principles, prevents the Hollander from being drowned by the ocean wave. The dykes of Europe would never have served as a barrier against the ocean wave, but for the adaptation and immutability of those laws. Whether we contemplate the rampart of a fortification, the lock of a canal, the rail-road, the suspension-bridge, the telegraph, or the acqueduct that supplies water to our city, we are alike constrained to admit, that without science the rules of art are a delusive *phantasm.* But why should those principles apply only to the solid earth? Why should they not apply to all departments of the mechanical world? Why should the construction of ships be the only exception to the universal reign of science? Has the ocean come to be regarded as an outlaw, which will obey neither the laws of the Creator, nor yet of the creature, man? Why is it that men of science shrink from the investigation of oceanic laws of construction? It is only because it requires a substratum of practical knowledge upon which to form a basis for scientific investigation. Men of science are quite willing to extend their explorations in the studio; but when a subject is presented for their study, in which both the physical and mental energies of the man are required for the discovery of those hidden laws of nature, they shrink from the duty, and leave blissful ignorance to riot, without a law of science, or a rule of art in the construction of the ship, that noblest fabric, which disdains to dwell in a state of maturity on the boundaries of the solid earth. But it may be inquired, what is the distinction between a *rule of art* and a *rule of thumb?* A rule of art is formed from the laws of science for the guidance of the operator in all

mechanical operations, and, as a consequence, has a substantial basis in the laws which govern the world in which we live, or the earth we inhabit. Not so with the rules of thumb, which are almost equally numerous. But there is no department of the mechanical world, in which they so greatly abound, as in the construction of vessels. From the earliest stages of formation or shape given to the vessel, to the time when the last mechanic passes the gang-way with his tools, they are everywhere discoverable. Rules of thumb are such rules as employers may think proper to adopt, having no other basis than that of *convenience*, *prejudice*, *or avarice*, and without recourse to any investigation in the fundamental truths of nature, which underlay all our knowledge of the globe we live on, or of that liquefied portion, which the demands of commerce require should be navigated, upon such terms only, as are equitable in the council chambers of *universal law*, or upon those immutable principles of geometrical science, which shine out in all departments of scientific investigation. A rule of art is the application of knowledge, or a power to effect a desired purpose; they are divided usually into two classes, the *fine* and *useful*; but when we speak of mechanism, we are at once understood as meaning a useful art, or rule of art. Hence we say, there should always be this distinction made between the rule of art and the rule of thumb. The former has the laws of nature developed by science for their basis, while the latter has the *phantasm* of a disordered fancy, the *chimerical visions* of present consequences and individual gain for its base.

(*To be continued.*)

[For the U. S. Nautical Magazine and Naval Journal.]

THE MERRIMAC'S BOILERS.

MESSRS. EDITORS :—If you deem a description of the Merrimac's boilers worthy of publication, you are welcome to it for such purpose.

The boilers of the Merrimac are built in utter defiance of true theory, so much so, that it will not be possible to get from them satisfactory results, as they must be deficient in their generating capacity, and require constant repair, for the following reasons :

The grates or furnaces, instead of being placed at the side, transverse vertical to the boiler, their proper positions are under the lower ends of the tubes at the bottom-side of the boiler. Now, when we take into account the fact that *full* or *half* the steam generated in the whole boiler is made on the furnace-plates, in immediate contact with the fires, and that in consequence of this misarrangement, all the steam made on the furnace-plates (one-half as stated) must first go up through the tubes located immediately over the said furnaces (as already shown) before it can reach the steam-room;

thus, *instead* of removing the tubes from the strongest action of the fire, as is claimed in Mr. Martin's patent, one-half greater volume of steam is made to pass up the tubes than would be required to pass, if the furnaces were arranged at the side first named, as in the first steamers of the Collins' line. The effect of this misarrangement will be to cause the surchargement or superheated steam—made on the furnace—on its passage up, as it impinges against the sides of the tubes—more especially at the back tubes where the fire first enters the flues—formed between the tubes, as *there the greatest body of steam* from that part of the furnace below the last-named tubes is made, while at the same time the *most intense heat* in the *whole boiler* will be formed in the shape of hot air and flame against these, and around the back-tubes, which are the first encountered by the flame, and its entrance into the tube-box. The result of such an arrangement will be to surcharge the steam on its passage through the tubes, thus causing the water to foam and effervesce thereby, causing the tubes to burn out and burst. Nor is this all; the fire-surface or the tube being filled with a mass of over-heated foam instead of water, of a low temperature, which last is the condition requisite to ensure the rapid and economical generation of steam, and also to secure the tubes against burning out, and the unequal expansion so destructive to all boilers.

On inquiry, it appears that nearly all of our war steamers, and some of our first class merchant vessels now building, have this boiler. What all this will result in, it is not hard to foretell.

CORRESPONDENT.

MARINE ODOMETER.

A PATENT has lately been granted in England, for an apparatus for indicating a ship's progress, by a Mr. Adcock. The instrument is connected with a driving apparatus, by a tube which contains a column of atmospheric air. The driving apparatus is actuated by the resistance of the water to the motion of the vessel, and consists of an open chamber, in which is fixed a wheel, somewhat resembling a screw propeller. The passage of the water through the chamber gives a motion to the wheel, which also, by means of an endless screw on its spindle, communicates power to another wheel acting upon the rod of a blower. The blower is formed of a cylinder, divided into two parts by a transverse partition, and from each half rises a tube. One of these tubes opens into the atmosphere, and the other connects with the instrument before mentioned. Each of the ends of the blowing cylinder is closed by an elastic cover, moveable by the rod of the screw wheel. These two covers are joined by a connecting link, so as to act alternately, one being drawn out when the other is thrust in, thereby counteracting the gravi-

tating tendency of the valve; and by means of the column of air in the tube connected with the air chambers of the indicator being set in motion by the blowing cylinder below, motion will be communicated to the corresponding elastic end of the cylinder of the indicating apparatus. The dial for indicating the progress of the ship consists of three flat gradular rings, rotating one with another. The motion is communicated to these rings by the in and out action of the elastic covers. This motion actuates two clicks that are made to take alternately into the opposite teeth of a ratchet wheel, giving it thereby a revolving motion; and on the axle of this wheel is a pinion, which geers in the teeth of a segment wheel mounted on a dial axis.—*Pen and Lever.*

THE NAVAL REVIEW.

FROM PUNCH.

Of Commons and of Peers
 Sing the terrible break down,
When on Southampton's piers,
Though invited by the Crown,
 They were all left to fume, fret and frown,
To accommodate the band,
Not a tender was at hand,
And the noblest of the land,
 Were done brown!

Three miles off afloat
 Lay the steamers on the brine—
The hour to sail for the Review
The tickets said was nine,
 But 'twas twelve that April morn by the chime
Ere they drifted on their path,
Dusty and tired to death,—
And Roebuck in his wrath
 Was sublime!

Even Wood himself had blushed
 To have looked upon the scene:
In the Harlequin were crushed
Bishop, and Duke, and Dean!
 "Its a joke," Lord Granville cried—when each gun
Heard afar with "hip, hip, hips,"
That the Queen had passed the ships,
And Lord Campbell's solemn lips
 Said "We're done!"

Brave hearts! 'Tis Britain's pride,
 When she bungles, to outdo
All the bunglers that have tried
What mismanagement can do.
 There's some excuse for all who misbehave—
Lucan, Airey,—injured souls!—
Called unjustly o'er the coals,
Each with bullied Wood condoles—
 Let them rave!

SHIPPIN AT HOME.

The following table, from the *N. Y. Herald*, gives a summary of the vessels in the harbors of New-York, Boston and Baltimore, on the 12th; and at Charleston, Savannah, New-Orleans, and Mobile, on the 5th of July:—

NEW-YORK.

Steamships	30	Brigs	134
Ships	130	Schooners	248
Barks	133		
Total			678

BOSTON.

Steamer	1	Brigs	49
Ships	40	Schooners	47
Barks	50		
Total			187

BALTIMORE.

Steamer	0	Brigs	21
Ships	15	Schooners	50
Barks	12		
Total			98

CHARLESTON.

Steamers	3	Brigs	8
Ships	6	Schooners	8
Barks	7		
Total			32

SAVANNAH.

Steamer	2	Brigs	3
Ships	6	Schooners	10
Barks	3		
Total			24

NEW-ORLEANS.

Steamers	4	Brigs	9
Ships	77	Schooners	14
Barks	26		
Total			130

MOBILE.

Steamers	0	Brigs	3
Ships	13	Schooners	6
Barks	2		
Total			24

NAVAL COMMISSION

FOR TESTING THE STRENGTH OF BENT KNEES FOR SHIPS.

STRANGE as the announcement may appear, the Navy Department, for the first time in its history, has appointed a Commission, for the purpose of determining the comparative strength of the materials for shipbuilding. The Commission consisted of J. L. Worden, Esq., 1st Lieut., and Benjamin F. Delano, Esq., Naval Constructor, of the Brooklyn Navy Yard. The time of commencing operations was on the 16th of July, 1856, continuing for six days. The place of operation was the Novelty Works, and the power applied was that of the hydrostatic press. The subjects of experiment were, "Bent knees, and knees of natural growth."

It is a most singular fact, that, in our haste to develop the resources of this vast continent, the subject of ship-timber and its fastenings should have been entirely overlooked; and more particularly the knees, which bind together the noble fabric upon which we so confidingly embark our lives and fortunes.

The knees upon which these tests were made were of the largest size, commonly used for hanging knees. In order to make the test analogous to the appliance in the vessel, a piece of oak timber of equal siding size with the knees was fastened to the body, representing a timber of the ship's frame; also another to the arm, representing the beam of a vessel. The body was secured upon an iron frame, in which the press rested; while the power was applied to the arm—on some, to contract the angle of the knee, by drawing it inward to a point of rupture; and on others, to thrust the arm outward to the rupturing point. In several cases the fastenings were found inadequate to hold the beam and arm together, although placed in about equal quantity, size, and distribution to the proportion commonly used in vessels. It should be considered, however, that the knees were of more than ordinary stamp in quality.

Result of Trial.

No. 1.—Bent knee, sided 10½ inches; moulded 10 inches at throat; remainder of size in throat made up of chock on the corner; angle of knee, 95 degrees; power applied, 5.37 feet, from corner of arm; and fulcrum at right angles with a point on the body, 1.92 feet from corner:

Bent inward, at ½ inch, required 5.500 pounds.	Bent inward, at 1½ inch, required 8.500 pounds.
" " 1 " " 7.500 "	" " 2 " " 10.000 "

No. 2.—Natural, or grown; sided, 10½ inches, moulded to corner; angle, 96 degrees; power, fulcrum, and fastenings, same as No. 1:

Bent inward, at ½ inch, required 3.500 pounds.	Bent inward, at 1½ inch, required 7.000 pounds,
" " 1 " " 5 500 "	" " 2 " " 9 500 "

No. 3—Bent knee, sided 10½ inches; moulded 11 inches in throat, and filled out to corner with chock, angle 88 degrees; power applied as in Nos. 1 and 2; fulcrum at middle of throat; fastenings as before distributed:

Bent inward, at ½ inch, required 6.500 pounds.	Bent inward, at 1½ inch, required 10.000 pounds
" " 1 " " 9.500 "	" " 2 " " 11 000 "

Note.—This knee (No. 3) was bent inward six inches, when the fastenings giving way, the knee was allowed to return, which it did; was refastened, and again bent inward, when it sustained within about 9 per cent. of its first pressure.

No. 4.—Natural or grown knee, sided $10\frac{1}{2}$ inches; moulded to corner; angle square, or 90 degrees; power applied, same as those before bent; fulcrum at middle of throat, at angle of 45 degrees, with arm and body:

Bent inward, at ½ inch, required 5.500 pounds.	Bent inward, at 1½ inch, required 9.000 pounds.
" " 1 " " 7.500 "	" " 2 " " 10.500 "

No. 5.—Bent knee, sided $10\frac{1}{2}$ inches; moulded 11 inches; filled out to corner with chock; angle right, or 90 degrees; leverage as before, 5.37 feet from corner; fulcrum at right angles from middle of throat, = to 3.08 feet:

Bent outward, at ½ inch, required, 8.000 pounds.	Bent outward, at 1½ inch, required 18.000 pounds.
" " 1 " " 14.000 "	" " 2 " " 22,500 "

Note.—This knee (No. 5) was bent outward 10 inches, without the least rupture, and the highest resisting pressure = 37,500 pounds; and on being relieved, returned to within $4\frac{1}{2}$ degrees of its former angle; was again subjected to pressure, and when at $11\frac{1}{2}$ inches from its relieved position, the pressure amounted to 36.000 pounds.

No. 6.—Natural or grown knee, sided $10\frac{1}{2}$ inches; moulded to corner; full and well-grown, with 5 feet arm, the very best the Navy or market could furnish: was prepared at the Navy Yard; angle, 82 degrees; fastenings, leverage, and fulcrum as before applied; one inch larger in body at commencement of throat. This knee had two trials, in consequence of the necessity of rearranging to secure equality of position.

On First Trial,

Bent outward, at ½ inch, required 7.500 pounds.	Bent outward, at 1½ inch, required 26.500 pounds.
" " 1 " " 20.000 "	" " 2 " " 33.000 "

On Second Trial,

" " ½ " " 11.500 pounds	" " 1½ " " 31.500 "
" " 1 " " 22.500 "	" " 2 " " 33.500 "

It broke at two inches in the throat, the rupture being complete. We have not extended the account of these tests of strength beyond two inches, inasmuch as the best-grown knees rupture at that point, and beyond which a ship would be rent into fragments, and no longer tenable.

It is a most singular fact, that, in the very face of scientific investigation, applied upon the most practical principles, there are those so steeped in prejudice, so thoroughly glued to their own opinions, that they dare not look the facts of this experiment in the face—men from whom more should be expected. Before these experiments were made, few could be persuaded that bent timber, and particularly bent knees, could be made available for nautical construction. It was boldly asserted, without a particle of proof, that they would approximate to their original form, and never would become rigidly confined to any defined shape or angle, however perfectly bent. It was our lot to have been chiefly instrumental in first attempting to bend knees; as a consequence, we were placed in possession of the first fruits

of bent knees—which knees, though small, have retained their position and angle for more than two years. There can be no question of the complete transposition of the fibre of the wood, by the end pressure principle of bending timber; and we can see no reason why that transposition may not be rendered as complete and perfect as the trials have shown them to be, in five minutes as in five hundred years—the age of the tree—when science shall have secured the alliance of nature's laws, and the American Bending Company shall have perfected their machines and appliances for bending timber for ships, through the channels of practical knowledge. If iron is made better by working, why may not wood be?

[From the London Nautical Magazine.]

THE COMPASS CONQUERED.

ROCKFERRY, 21*st June*, 1856.

SIR,—My allusion, in your last number of the *Nautical*, to the electric agencies which constitute, in an iron ship, a species of ever-varying galvanic arrangement, together with the remark that we must look to the chemist for aid in seeking a remedy for compass vacillations, has doubtless raised in the minds of many of your readers suspicions as to the capability of such remedies (if found) being available by men who are not, as a body, specially prepared either by education or abundant leisure for delicate scientific manipulation. I beg to acquaint you, that experiments, since my last letter, leave no doubt on my mind of the possibility of so nearly insulating a ship's compass, as to render any amount of local attraction imperceptible on the compass card.

From the few words I addressed you, (marked "confidential"), hinting vaguely at the means employed, you will not, I am sure, accuse me of speculative puerility in my belief in this insulation; and as I before promised, I shall be happy in a future number of this Magazine to lay before the public the nature of my recent experiments, with their results, in order that abler hands may pursue the all-important subject with better facilities, if such be desirable. But I must record a belief, that the delicacy and cost of an instrument which would be necessary to render a compass-needle self-correcting, (as I was about to propose), and the increased scientific attainment which seamen would require to render its use infallibly effective, would rather be altering the nature of existing difficulties than evading them. I speak thus candidly and without hesitation, from the only hope to render, in my humble way, some permanent help to the compass question. We have, as an illustration, the Dipping Needle, an instrument of such capabilities and so useful, when it can be used, that no one would dispute its value, in such case, to a commander of a ship; but, unfortunately, here again its delicacy is such that on shipboard it is a failure. Precisely so, I fear, would be my expected insulator, and from like cause. But, sir, I should not have felt justified in raising hopes of effective remedy, if I had not had a second string to my bow. Like second thoughts, second strings often do the most work; and I trust to show that in this case failure with the first establishes, by this very failure, the importance of its successor.

So much of late years has been said and written on the Mariner's Compass, that many are bewildered and disheartened; and it is evident that this feeling would be increased were I to stop here, (if it be possible that my very feeble attempts could have much influence.) It is, however, highly pleasant to be able to offer at once to your nautical readers something more substantial than the description of a cruise in the wake of an ignus fatuus —assuming and declaring (fortunately for my credit sake), that on very near approach it bore no resemblance to any of the wild-goose species, as I am prepared in due time to show. On concluding the above chase, I found leisure to breathe and survey more clearly, from the higher land which I had ascended, the exact present position of what is so widely known as the Compass Question; and in this letter, after briefly showing what it really is, I would define what we really want; and propose what I declare to be a thorough and perfect remedy.

1st.—This really is the Compass Question:—

Captains of iron ships and of many steamers complain that they cannot depend on their compasses. These compasses, before the ship sails, undergo the best correction that the present state of science, and in the hands, too, of competent men, can devise. Boards and committees of distinguished men are selected and formed; private subscriptions, assisted by the Board of Trade, provide the means; and the energy and direct interest of even the Compass Committee themselves are, together with those of the whole naval and mercantile world, involved in the search of further help. As a proof of the intensity of their zeal, costly fittings are adopted, whereby to lessen, if possible, the evils of local attraction; and it cannot be denied that very often these evils are greatly diminished; but there is so little chance of permanence in the efficacy of any present mode of correction, that a venerable and most experienced gentleman (all honor to him!) has even gone to the antipodes in an iron steamer in order to make further research! And this principally because it is often found, to the dismay of the mariner, that local changes in a ship's position, such as change of hemisphere, immensely affect, even to annihilation, the most careful corrections made at a distance.

The last phase which the compass question has undergone does infinite credit, not only to the promptitude, but to the judgment of the Liverpool Committee. They have adopted the valuable suggestion of Sir John Ross, made several years since, and afterwards by Mr. Birdwood, R. N., in 1846, in the pages of your Magazine, and as recommended in principle by my unworthy self, in my published address to the Liverpool shipowners, in 1852. They have caused to be painted within these few days, in large and conspicuous figures, on the walls of the Liverpool Docks, the compass bearings, in degrees, of a tall prominent chimney, as coinciding with these points: thus enabling a vessel when at anchor, or as she leaves the Mersey, to correct her compasses by mere comparison with these marks It is admirably done, and worthy of imitation at other ports; and I hope soon to hear of its adoption at all the principal headlands in the British dominions. But imagine the whole coast of Europe, Asia, Africa, America, and Australia to be painted thus! Would this prove a perfect remedy? Certainly not—far from it. As an instance—a few days since, in speaking to a captain of an iron steamer just arrived from foreign service, who appeared still weary and hoarse from two or three nights' exposure on deck, and in only moderate but thickish weather in the channel,—his reply to my friendly question, "But could you not get at least some rest on these occasions?" was simply

this: "Yes; but I am always afraid to trust my compasses, and we could not see the land?"

Now, sir, devoted as your Magazine has always been to the best interests of naval and mercantile captains and officers, surely I may be borne with while remarking on this state of things. Why, the hard-earned reputation of a captain of forty years' experience, who never before damaged a sheet of copper from touching terra firma, hangs by a thread, because he can depend so little on his compass! The office of commander of a merchant vessel is one of immense responsibility, care, and peculiar hardship. I should be ashamed to draw such a conclusion from the circumstance of two or three nights' exposure; nor would they sanction its mention It is their avocation—their lot; and for ages' endurance has been the proverbial character of British seamen; nor have, as all the world know, either sailors or soldiers degenerated. But is it not adding needlessly to the cares of a most honorable and distinguished class of our fellow men, when we permit the slightest hope of the amelioration of those evils which press on them through the compass question to go unheeded? For it must be borne in mind, that, since the supervision of the Board of Trade adds to the security of commerce, it is at the cost of great personal privation, and increase of danger to the reputations of merchant captains—through the errors which affect the best regulated compass. Where no indication on land, like those on the Mersey, are visible, I would ask,

Secondly,—What we really want?

A sailor only wants to know what course to steer by his ship's compass, to bring him by the shortest route to his destination. But, in the absence of all honest guides, (as his compass deceives him), it appears to me that at sea, in order to render the compass reliable, there can be but two kinds of remedy or correction. The one would be a perfect or sufficiently approximate insulation of the compass-needle from all but terrestrial magnetism—(and this I have now no hope of ever seeing); the other would be by instrumental correction. As regards the latter, my object is not to deny any man's attempt, much less would I wish to disparage such corrections as, in the absence of better, have been sanctioned by so high an authority as the Astronomer Royal. But it appears that all corrections by instrument or apparatus may be separated into two classes, namely—the one dependent on magnetism, or some modification of it, (but which Compass Committees pronounce to be inadequate); the other, depending on the help of the quadrant or sextant, as used with the heavenly bodies. And here again we are met with hitherto insurmountable difficulties in actual practice. What we really want, then, is, (no matter from what source), to be able readily to ascertain the true direction of the cardinal points of the compass; and, by a method which requires little or no calculation, available at most times of the day or night, either at sea or near a coast—a method clear and positively efficacious, always to be constantly relied upon. In considering, therefore,

Thirdly—A thorough and perfect remedy,

I beg leave respectfully to acquaint you, that, after much labor, I have succeeded in producing an infallible correction of the following general nature; namely—I thus publicly undertake to suspend, in a captain's state-room, or to attach to his timepiece, a very sightable, and in many of its other applications, a highly useful and instructive instrument, (very cheap, even to a few shillings; or expensive, according to the will and means of the possessor, (which will, without reference to books, or more knowledge

than the captain of a ship carries in his head at present, and by means of a slight mechanical movement, aided by a second act equally simple, which will, I say, give such captain *his true compass error.* He may keep this instrument in his writing-desk, or even in his waistcoat pocket. I speak deliberately when I assure you that it is so ridiculously simple, (alas! *parturiunt montes nascetur ridiculus mus*), so perfectly unpretending is this instrument, that sailors, with all their professional gravity, must laugh at it. I only hope it may not from its simplicity be underrated. In itself, as an arrangement, it is so comprehensible, that any master of a vessel, of common intelligence, will, on once seeing it used, clearly comprehend it. I furthermore see no reason why the compass error should not henceforth be entered in the log every watch, when practicable.

In apologizing for a somewhat enigmatical and apparently selfish style of introduction, I beg to explain that, apart from pecuniary considerations, but from strong advice, I wish to preserve entire control over the manufacture, as great accuracy is required in the construction, although it is not easily damaged or broken when once made. But a full description shall, as soon as possible, if permitted, be given to the public, through your Magazine, with many thanks for your condescension in allowing me thus far to trouble your valuable pages.

I have, &c.,

S. M. Saxby.

[From the London Mechanics' Magazine.]

MERCHANT SHIPPING REGISTRATION ACT.

In making a few comments on Mr. Atherton's letter in our last Number, we beg again to assure him that we entertain a very deep respect for his honesty of purpose, integrity, and capabilities, although we cannot give in our adhesion to all that he has written on Tonnage Registration. Our object in the remarks we have made on this question has been the elucidation and confirmation of truth. We took up Mr. Atherton's Essay in no hostile spirit—quite the contrary; but felt compelled, from our convictions (for which we have a right to claim as much honesty as Mr. Atherton would demand for his), to express our dissent from a considerable portion of it.

Comparing the letter which we last week inserted with that Essay, we cannot help congratulating Mr. Atherton upon the manifest improvement which has taken place in his opinions, although they are still far from being faultless. We have, however, reason to complain of his mode of expressing himself on several occasions; probably the meaning conveyed to others is not that which was intended, but the effect is the same, whether intended or not. For instance, we are told that we are "*constrained* to acknowledge, and at the same time palliate the insufficiency of the law of 1854." Now, what is it that "constrains" us to offer any opinion? Mr. Atherton's words would imply that we have put ourselves into the attitude of an advocate, and that we are *unwilling* to make any admission that might seem to tell for him. This is a gratuitously assumed conclusion" on his part; and if he wishes credit for honesty—which we are by no means inclined to refuse—we may, as we have said, at least claim equal credit for it ourselves.

Mr. Atherton complains that we, in common with many others, have mis-

understood, and so misstated, the purpose of his paper, and have consequently tributed to him conclusions which he disavows. If this be so he has no one to thank but himself for such misconceptions. For instance, it appears now that he had no fault to find with "internal roomage" as one element of registration, and still less with the "*mode*" of measurement, which he regards as a mere "question of detail;" although he does entertain an opinion with regard to the relative merits of Mr. Peake's and Sterling's rule, about which we shall have something to say hereafter. Our notion of what Mr. Atherton meant was derived from such paragraphs as the following:—"In the first place, let us enquire what is the meaning of the term *tonnage*, as made use of in shipping registration, under the now existing law, namely, the Mercantile Shipping Act of 1854? what matter of fact or measurable realities does the term tonnage signify? has the *tonnage* of a ship any specific relation either to the displacement of the ship or the nett tons weight of cargo the ship will carry, or the quantity of cargo a ship will hold? does the registered *tonnage* correctly answer any purpose as the base of calculation in commerce, *or as preventing fiscal* imposition? does it equitably constitute the base of building contracts? or answer any useful purpose in scientific inquiry, as affording elementary data available for determining the relative locomotive merits of ships? Finally, does the registration of *tonnage*, under the existing law, afford any information whereby cupidity and recklessness in the loading of ships can be officially exposed or checked in a manner conducive to the safety of property and life? Such are the points which we purpose inquiring into; and if the present system of tonnage registration does not fulfil these requirements, it is purposed to submit to the consideration of the Society of Arts such suggestions as may conduce to the attainment of these objects."

We need scarcely observe that the paper consists in proving that the "present system" does NOT fulfil these requirements, and suggestions are offered accordingly. As regards the *mode* of measurement again, which we are now told is a mere matter of detail, our readers shall hear what Mr. Atherton has to say in the following passage, almost before he has fairly entered on his subject, and judge whether we have misstated him. "Under this Act of 1854, a system of tonnage admeasurement, based on internal capacity, but reduced by a factor (divisor 100), in order that the aggregate of tonnage, as measured by this new law, might correspond with the aggregate, if measured by the old law, has now become the law of the land; and *although* this commission commenced its labors under the avowed and recorded declaration, 'that it is desirable to establish an easy practical mode of admeasurement,' the specification merely of the outline of the system of admeasurement, as prescribed by the Bill of 1854, occupies no less than ten clauses in the Act, and the detail of working out the calculations, to be properly understood, and not done by rote, demands a course of laborious mathematical study. This system being merely the application of mathematical routine to the curvature of bodies, its accuracy may be admitted; but the prescribed detail of instructions to meet various sizes of ships and various peculiarities of construction, have been made so multifarious as to complicate the application of the system, and to render the practical operation whereby the results are obtained a mystery, unintelligible to everybody excepting those who make it a professional study."

Pretty plain speaking this; and yet Mr. Atherton is astonished that Mr. Moorsom (not we) designated his paper a "condemnatory harangue."

Again: "the inveteracy of blind habit cannot be better illustrated than

by the fact that the old rule for calculating tonnage, without reference either to the depth of hold or draught of water, withstood the declared condemnation of several successive Parliamentary commissions, and continues to be pertinaciously made use of to regulate ship-building contracts, and the purchasing of ships in mercantile dealings, and even by Government authorities, though legally superseded in 1854, by Act 5 and 6, William IV., c. 56, which thus twenty years ago prescribed and legalised a totally new system of tonnage admeasurement based on ordinates, as hereinbefore referred to, which system failed to be properly adopted on account of its complication; but nevertheless a far more complicated extension of the same system has now been introduced by the Merchant Shipping Bill of 1854 . . . Popular education has doubtless of late years made great progress; but still we have scarcely arrived at such a state of proficiency as to render it advisable that our tonnage admeasurement, so constantly put in requisition by every merchant, should be the solution of the mathematical problem for the *reduction of parallelopipedons by rectangular co-ordinates.* Were the new measurement of 1854 honestly called by this its proper name, it would not be listened to for one moment; the very name would expose it; but, instead of being thus designated, it is called Sterling's simple and easy system of admeasurement. Undoubtedly Sterling's reduction of parallelopipedons by rectangular co-ordinates, like the calculation of eclipses, may be simple and easy to those who perfectly understand it, but a mystery to those who do not, and very likely to be bungled by those who attempt to apply it in ignorance of the principles involved.

Such was Mr. Atherton's "declared condemnation" of Sterling's rule on the 16th of January. On the 27th of May, the same gentleman considers the "*mode* of measurement a question of detail." He has "no desire to depreciate Sterling's rule," and is surprised at our directing so much of our readers' attention to it. We congratulate him on his change of opinion, but we really must demur to his including this among the "gratuitously assumed conclusions" which it appears we have been pleased to represent as the purport of his paper, and have so misstated his case.

As regards his imputed attack on the shipping interests, we have already expressed our opinion that he intended no serious charge against them. He now denies that his words are capable of any such construction, and we do not doubt his sincerity in this declaration. Mr. Atherton, however, must have far less experience in the ways of the world than we give him credit for, if he is unaware that far more serious damage can be done to reputation by an apt introduction of it into the company of characters about which there can be no mistake, than by any direct imputation. And we must say, that when *apropos* to the subject of registration, *boroughmongering*, opposition to free trade, fraudulent declarations of dividends, to say nothing of the imputed corrupt resistance to reform by the professions of law, physic, and divinity, are brought upon the *tapis*, the shipping interests, who are not conscious of their imputed short coming, naturally feel aggrieved at being placed in such questionable, or rather unquestionable company. It is more in what is implied than in what is decidedly said, that the "insult" was felt to consist. However, with the ample explanations of Mr. Atherton, the parties concerned would be unreasonable not to be satisfied.

Our remarks, be it observed, went only to the point, that the necessity and the advantage to the public of a change of registration had not been established on such reasonable grounds as to afford any parallel between the shipping

interests and other notoriously corrupt bodies declining to petition for their own reform. But is it not assumed that this necessity and advantage have been incontestably established in the whole paragraph complained of—especially in the peroration?—" What right or reason, then, have we to expect that the shipping interests will voluntarily petition the legislature for an effective system of registration, *throwing open the mysteries of their craft with a view to the public good.*

Then, again, Mr. Atherton hardly states the case fairly, when, in disavowing the conclusions which have been erroneously attributed to him, he says, " For instance, by my paper I did not object to internal roomage as one element of tonnage registration; but I upheld it as indispensable to a complete system of registration.

To state the case fairly, Mr. Atherton ought to have told us the *relative importance* of the registration of the " internal roomage" as at present by law established, and as it would be in accordance with his own suggestions. By the Law of 1854, the internal roomage, divided by 100, constitutes the tonnage of the ship on which harbour dues, pilotage, light dues, and the like are to be assessed." According to the proposed system, the registration of "internal roomage" is of very minor importance, and might be entirely omitted with little or no inconvenience. It would scarcely be missed. Mr. Atherton suggests in his paper, that the " 'builders' measurement,' which is also to indicate the size of the ship on which the various dues are to be assessed, should be determined by taking the product of the external length and breadth as measured at the regulation deep draught water line multiplied by the *internal* depth of the hold, and divided by 100," corrected by a suitable factor, " according as the intended ship may be proposed to be built with full lines burdensome for cargo, or finer lines more adapted to speed." The *main* issue, therefore, is necessarily raised between these two measurements —for *fiscal* purposes: and as the greater part of Mr. Atherton's paper is directed against the established measurement as *suitable for this purpose*, we do not think that gentleman has much reason to complain of " gratuitously assumed conclusions" on our part, or of the term " condemnatory harangue" against the Merchant Shipping Law of 1854, applied to his paper by Mr. Moorsom.

Any one perusing his letter in our last number, and not well acquainted with his original paper of January 16th, would go away with the impression that he left internal measurement to perform pretty much the same functions as at present, only suggesting other matters " in addition." Whereas the real question is the much-vexed question between *external* and *internal* measurement as the basis for levying light and other dues!

By-the-by, as Mr. Atherton is so exacting in his requirement that the term tonnage, as made use of in shipping registration, (and he will scarcely deny that levying dues is one of its principal uses,) should "signify" some " matter of fact or measurable *reality*;" what " matter of fact or measurable reality," we may, in our turn, inquire, does the proposed builders' measurement represent, " having *two external* elements, and one *internal?*

As for the *admissions* which it seems we have made, of which Mr. Atherton certainly is not inclined to throw away the benefit, we really went further than he states; we allowed that the present mode of measurement was only the *second best* resource of the Government, who had been foiled in their attempt to legalize an equitable system of external measurement. They fall, however, very far short of an admission of all the "grounds on which 'Cory-

phæus' the agitator based his 'condemnatory harangue.'" That worthy gentleman must have strangely forgotten his own paper—or must give credit to others for a very short memory—or he would tell our readers that the assumed encouragement to ship-owners to dangerously overload their vessels held out by the present registration, was one only among many other grounds on which his "condemnatory harangue,' was based. We have, for instance, first of all the "complication" of the rule itself, which was stated to be unintelligible to all but professional persons, and such as to render its application abortive; this, too, subsequently enlarged upon, as we have already shown. Next we had the "assumed" misapplication of the term "tonnage" as applied to "roomage," and not to "weight" or burden. Thirdly, the assumed insufficiency of the guarantee given by the new rule, or "inducement to builders tending to improvement in the form or build of shipping." Fourthly, its incompetency to afford data for the comparison of the *locomotive* merits of ships—to say nothing of an "assumed" ambiguity in the term tonnage itself, as defined by law, which we showed to be a mere creation of Mr. Atherton's brain. All these points were jointly and severally, and "verbosely," aye, verbosely descanted on, as most cogent reasons for substituting Mr. Atherton's propositions for the present law, which, if we are not egregiously mistaken, was the true purport of his paper. He now, however, limits his observations to one only of these points, viz., the encouragement given to the dangerous overloading of ships, on which ground, in consequence of our admissions, he thinks himself safe.

He joins issue with us on our statement, that a vessel of 1,000 tons registered tonnage, may safely be considered by the owner to be capable of bearing 1,000 tons weight. This he answers by an "assertion," of the truth of which he gives us no means of judging, that the safe loading of two ships of the same nominal tonnage may vary in the proportion of 30 to 5, and that while one vessel of 1,000 tons may safely carry 1,500 tons weight of cargo, and in addition to 1,500 tons by measurement of light cargo—in all 3,000 tons—another may safely carry only 500 tons weight. We may well let this assertion go for what it is worth; for our part, until we have some data in its favor to rely upon, we withhold our assent.

A vessel of 1,000 tons registered tonnage has an *internal* capacity of 100,000 cubic feet. 1,500 *tons weight* of cargo represents a displacement of 52,500 cubic feet of water; and 15,000 tons of light cargo at 40 feet to the ton, represents a displacement also of 52,500 cubic feet; so that the whole displacement of such a vessel between the light and load draughts is 105,000 cubic feet—5,000 feet more than its internal measurement! To this we must make a considerable addition for the light displacement. The vessel in question must, therefore, have an *enormous difference* between its external and internal measurement—an unheard-of thickness of scantling to carry so much weight, and that, too, at a safe distance below the deck! The other poor ship, which may carry 500 tons *weight*, is limited to a difference of displacement of 17,500 cubic feet; and yet their internal space is the same. *Credat Judaeus!* Now, we have asserted that a ship of 1,000 nominal tonnage may be fairly reckoned upon for carrying 1,000 *tons weight* of goods. This is allowing only 35,000 cubic feet of sea water for the displacement of such a vessel between the load and light draughts! This is so much within bounds that we might safely have ventured upon a higher figure.

(*To be continued.*)

OUR STATE ROOM.

New-York.—The Surveying Expedition—Arrival of the Vincennes.—The U. S. Ship Vincennes, Comdr. Rodgers, arrived on 13th ult., from the Pacific, 74 days from Tahiti, after an absence from this port of 38 months, during which time she has sailed nearly 70,000 miles, and made extensive surveys of much value to our mercantile interests.

These have been chiefly among the chain of islands, extending from Formosa to the southern limits of Japan—the islands and coasts of Japan, Kamschatka Behring's Straits, and the Arctic Ocean.

Early in May the Surveying Squadron, under Commander Ringgold, left here for Norfolk, to receive the instruments which had been forwarded from Washington, and after a short detention, finally sailed from Hampton Roads, 11th of June—visited Madeira and Porto Praya, and arrived at Simon's Bay, C. G. H., about the middle of September, 1853, nearly one year after the passage of the "act for its organization."

Both the Hancock and the Porpoise, recently overhauled at the Dock-Yard, required extensive repairs and alterations, which caused a delay here of two months.

On leaving the Cape, the several vessels took different routes, the Vincennes and Porpoise standing to the southward, to ascertain the strength and constancy of the westerly winds, between the latitudes of 40° and 46° south. During the first part they were fresh and steady from the west, and from the longitude of 44° to 117° east, it blew a heavy gale for thirteen days, accompanied by enormous seas, which constantly broke on board, deluging the ship, and staving some of the boats.

The Vincennes visited Sydney, N. S. W.—remained there a week, and thence passed through the "Coral Sea"—a region of light winds and calms, and too thickly beset with dangerous shoals and reefs, ever to be much frequented by navigators, who can find any other route from China to Australia. Passing through the Soloman and Caroline Groups, she arrived at Hong Kong, 19th March, and found the Porpoise already there, leaking badly—she was extensively repaired, and thought to be quite as strong as ever.

The Hancock, Comdr. Rodgers, proceeded to Gaspar Straits, accompanied by the Kennedy and Cooper. Much time was devoted to making careful detailed surveys of this dangerous passage, and of a portion of the China sea. All the vessels reached Hong Kong in the month of June, 1854.

The insurrection in China caused another unfortunate interruption in the movements of the squadron, at a time too the most favorable for prosecuting the southern portion of it. The vessels were just ready for sea, when the Consul and merchants called for aid to protect American interests at Canton; thus six months more were lost for the objects of the expedition.

In September, 1854, the squadron was reorganized, Comdr. John Rodgers succeeding to the command, and notwithstanding the lateness of the season, proceeded at once to the North, to examine and survey the extensive chain of islands lying between Formosa and Japan—the Bonins, and many in that part of the Pacific still inadequately known and very inadequately surveyed.

To have gone south at this time, might have proved disastrous to officers and men, who had already become much enervated by two successive tropical summers. They required a bracing atmosphere.

The weather, during the greater part of this cruise, was tempestuous, and very unfavorable for surveying; still, a great deal of valuable work was done, and much information obtained, which proved most useful in subsequent reconnaissances.

The officers speak in commendation of the beautiful scenery and of the number and excellence of the harbors, discovered in the island of Ousima, lying midway between Loo Choo and Japan. This is an important position for our whalers, and probably for our contemplated steamers for China. The island, the very existence of which has been doubted, and on some recent charts, entirely omitted, has been carefully surveyed and plotted, and the names of the unfortunate officers of the Porpoise given to the principal peaks, headlands and bays.

The whole of this work is entirely new to the world; the natives knew of no foreign vessel having ever touched there, except one American whaler in the year 1847. Her captain had entered an insecure bay, and believing all the others equally bad, had left without further exploration.

The survey was extended to the southern island of Japan, Kiusin, where the Vincennes entered the spacious bay of Kagosima, having an average breadth of six miles, and twenty miles long, with deep water, and anchored in a small harbor a few miles from the entrance.

Officers were permitted to land on the beach, to make observations for a time, without molestation, and the ship was supplied with wood and water; but every attempt to pass beyond the shore-line was opposed by the authorities of the place.

On all occasions, the common people were found to be friendly, and seemed most anxious to cultivate the acquaintance of their new visitors.

On the second of January the hills were white with snow, which melted away in the course of a few hours, although the keen north wind continued to blow throughout the day, to the great annoyance of the natives, whose thin cotton garments were no protection against the cold.

The "Hancock," Lt. Stephens, and "Cooper," Lt. Gibson, made successful explorations along the northern coasts of China, the Gulf of Pechili, the Piho River, the Sea of Ochotsk, and the Kurile and Aleutian Islands.

In 1855 the Vincennes, on her return from Hong Kong, continued the surveys along the coast of Japan, visiting the recently opened ports of Si-

moda and Hakodadi—along the coasts of Kamschatka, Behring's Straits, and the Arctic Ocean, which was penetrated as far as 72° 5′, North latitude, the highest point ever attained by any vessel in the same longitude.

Soundings were taken every half hour during the ship's stay in the Arctic, showing 25 to 35 fathoms of water.

Excellent harbors were found at the Straits of Seniavine, and in the Bay of St. Lawrence.

At the former port a party was landed to make observations during the absence of the ship, who were kindly treated by the Tchouchis Indians, the natives of the country.

Every opportunity was embraced to obtain deep sea soundings, temperatures, currents, and every species of information likely to be useful to science. The deepest soundings were over 16,000 feet.

The launch of the Vincennes, Lt. Brooke, made an interesting cruise of 500 miles along the Island of Niphon, entering every bay or river of any size and importance.

Great curiosity was exhibited, and much kindness shown to them by the common people, and the chiefs had but little of the arrogance of the officials nearer the capital. Provisions were supplied them in abundance.

The cruise was eminently successful, and reflects the highest credit on all who were engaged in it.

Our limits permit us to give but a faint outline of these operations, which have extended over a space of more than three years; but we hope that a full report will be published by Congress, on a liberal scale, and illustrated, in the best style of art. The artists have ample material for such a work, which should be given to the world in the best dress the times afford.

Officers of the Vincennes.—Commander John Rogers, Commander of the Expedition. Lieut. Commanding—H. K. Stephens. Lieutenants—J. Van Collum, T. S. Fillebrown, J. H. Russell, B. Kennon. Fleet Surgeon—W. Grier. Purser—W. B. Boggs. Commander's Secretary and Draftsman—R. Knox. Assistant Do.—A. Witzleben. Zoologist—C. Wright. Assistant do. and Artist—E. M. Kem. Commander's Clerk—F. H. Bierbower. Purser's Clerk—C. T. Nibloy. Assistant Astronomer—A. Schonboen. Master's Mate—J. Kent. Carpenter—J. H. Owens. Sailmaker—R. Perry.

The Store Ship *Relief* arrived on the 12th ult. She sailed from Rio de Janeiro on the 28th May.

Officers.—James W. Cooke, Lieut. Commanding. Watson Smith, Theodoric Lee, Charles P. McGary, Joseph P. Fyffe, Lieutenants. C. J. Emery, Purser. Wm. E. Wysham, Assistant Surgeon. Passenger—George Wells, Lieut.

The *Supply*, Lieut. Commanding D. D. Porter, is nearly ready for sea—after another load of camels.

The Frigate *Potomac*, Flag Ship of Home Squadron, Commodore Paulding, arrived on the 15th ult. Seven days from Key West.

The *Wabash* has been detailed for Commodore Paulding's flagship, and the officers and crew of the Potomac ordered to her.

The *Arctic*, Lieut. Commanding Berryman, sailed on the 18th ult., to make soundings for the New-York, Newfoundland, and London Telegraph Company.

The Store Ship *Release* is fitting out for the Home Squadron—Lieut. Jas. H. North has been ordered to command her; and Lieut. G. W Young; Passed Assist. Surgeon, Otis; Master, C. E. Hawley, and passed Midshipman, R. J. Boyd, have been ordered to her.

BOSTON.—The *Merrimac* arrived in Boston on the 6th ult., ten days from Key West. She has been ordered into dry-dock, crew transferred, and officers temporarily on leave. Passed Assistant Surgeon Suddards has been ordered to the Receiving Ship *Ohio*, in place of Otis, ordered to the *Release*.

NORFOLK.—There is much activity on this station. The *Roanoke* and *Colorado* are both progressing rapidly towards readiness for sea. The *St. Lawrence* has been ordered to fit out, and Captain French Forrest is reported to be ordered to her, to command the Brazil Squadron. Lieut. R. Pegram has been ordered to the Yard, in place of Lieut. North ordered to the *Release*.

The Practice Ship—Sloop-of-war *Plymouth*. The following is a list of her officers: Commander—Jas. F. Green. Lieutenants—W. A. Wilcox, J. Van Ness Philip, J. Taylor Wood, Millson McGunnegle. Purser—B. Frank Gallaher. Passed Assistant Surgeon—John Ward. Carpenter—Henry V. Leslie. Gunner—John Webber. Sailmaker—Wm. B. Fugett. Boatswain—Philip J. Miller. She has over fifty midshipmen on board.

WASHINGTON.—The Minnesota has had steam on for eight or ten hours, and her machinery is reported to work perfectly. She will soon proceed to sea on a trial trip.

EXAMINATION OF ASSISTANT ENGINEERS.—The Secretary of the Navy has ordered a Board of the Chief Engineers of the Navy to convene at Washington on the 17th of August next, for the purpose of examining assistant engineers, for promotion, who were absent from the country at the last examination.

PROMOTIONS.—*All* the officers, promoted by the findings of the Naval Board, have been confirmed by the Senate.

NAVAL REFORM IN THE SENATE.—The following BILL has at last passed the Senate.

A BILL to amend an Act, entitled "An Act to Promote the Efficiency of the Navy."

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, that upon the written request, made within ninety-days after the passage hereof, or within thirty days after the return of any officer absent from the United States at the time of the passage of this act, provided he shall return within one year after the passage of this act, by any officer of the Navy, who was dropped, furloughed, or retired, by the operation of the act of the 28th of February, 1855, entitled, "An Act to promote the efficiency of the Navy," the Secretary of the Navy shall cause the physical, mental, professional, and moral fitness of such officer for the naval service to be investigated by a court of inquiry, which shall be governed by the laws and regulations which now govern Courts of Inquiry; and the said Court shall in their finding, report whether the said officer, if he has been dropped from the rolls of the Navy, ought to be restored, and if restored, whether to the active or reserved list, and if to the latter, whether on leave of absence or furlough pay. And in case the officer making the written request, as aforesaid, shall have been placed on the reserve list, then the Court in their finding shall report whether the said officer ought to be restored to the active list, or, if not restored, whether he ought to remain on the retired list on leave of absence or furlough pay; and the finding of the Court shall, in all cases, be submitted to the President of the United States, and, if approved by him, in the case of a dropped officer where restoration has been recommended, such officer may be nominated to the President for restoration to the service, according to the finding of the Gourt as approved by him; and in the case of a retired officer, the finding of the Court, when approved by the President, shall be conclusive, and such officer shall be restored to the active list, to occupy that position and rank in the Navy which he would have occupied had he not been retired under the action of the late Naval Board; or he shall remain on the retired list, on leave of absence or furlough pay, according to the finding of the Court as approved by the President. *Provided*, that the officers so restored or placed on the reserved list, shall be appointed to their places respectively by the President, by and with the advice and consent of the Senate.

SEC. 2 *And be it further enacted*, that the operation of the present law limiting the number of officers of the Navy shall be suspended so far as to authorize the restoration, within one year from the passage of this act, by the President, by and with the advice and consent of the Senate, of officers reserved or dropped under the operation of the act of the twenty-eighth of February, eighteen hundred and fifty-five, entitled "An act to promote the efficiency of the Navy:" *Provided*, that there shall be no further promotions or appointments in any grade after said restorations shall have been made thereto, until such grade in the active service shall be reduced to the limit now

prescribed by law. That when any such officer shall be restored to the Navy by and with the advice and consent of the Senate, the officer so restored shall occupy that position and rank in the Navy which he would have held had he not been retired, furloughed, or dropped, by the order of the President on the report of the Naval Board: and

Provided further, that any dropped officer who may be in the opinion of said Court entitled to be placed on the retired or furlough list, may be thus placed by the President, by and with the advice and consent of the Senate.

SEC. 3. *And be it further enacted*, that officers who were dropped, as aforesaid, and who shall not be restored to the naval service within one year from the passage hereof, shall be entitled to receive one year's duty pay of their grades, respectively; and the President shall be, and he is hereby, authorized, with the advice and consent of the Senate, to transfer any officer from the furlough to the reserved pay list; and that so much of the act of February 28, 1855, entitled, "An Act to promote the efficiency of the Navy," as renders reserved officers ineligible to promotion, be, and the same is hereby, repealed.

SEC. 4. *And be it further enacted*, that reserved officers may be promoted on the reserved list, by and with the advice and consent of the Senate, but no such promotion shall entitle them to any pay beyond that to which they were entitled when so reserved, nor shall they, by such promotion, take any higher rank than they would have taken had they been retained in the active service of the Navy; and nothing in this act, or in the act to which this is an amendment, shall be so construed as to preclude officers on the reserved list from wearing the uniform of their grades respectively.

SEC. 5. *And be it further enacted*, that captains in command of squadrons shall be denominated flag officers.

SEC. 6. *And be it further enacted*, that all officers who may be restored to active service under the provisions of this Act, shall be entitled to draw the same pay they were drawing at the time they were retired or dropped, for and during the time of such retirement or suspension from the active service aforesaid.

It has not yet (26th July) been taken up in the House, though it is generally believed that it will pass that body without material modification. Gratifying as is the circumstance to all parties concerned, that the Senate has given so much attention to the sufferers, in endeavouring to make amends to the exceptions in faithfully carrying out the law to promote the efficiency of the Navy, we are, nevertheless, exceedingly surprised that their assiduity should at last result in the creation of ANOTHER BOARD, to save this honorable body, the President and the Hon. Secretary of the Navy, the necessity of taking the responsibility which properly belongs to them, into their own hands. The same powers which have enabled them to nominate, appoint, and confirm the officers who have been advanced by the late Naval Board, are fully, and as

justly, equal to their action on those who have been retired and dropped by the same law.

The Board now contemplated has to set on the action of the preceding one, and subject a large number of both the unfortunate and the guilty ones to an additional mortification and *confirmation*, and to condemn the previous Board in so much of their action as this one does not confirm. The same amount of odium, complaint, and discontent is just as likely to come on this as on the first Board, and their action is fully as likely to result in dissatisfaction. A repetition of the sentence is not likely to mollify its severity, and the only just court of appeal is that which now shirks the duty. Have no more Boards—let the same influences which would admit an officer to the Board contemplated by the Senate Bill, justify his nomination to that Hon. Body for promotion; it is in their power to obtain all the necessary information to confirm or reject him.

Navy Yard Politics.—There is no one cause which does more injury to the public service, than politics. In our public works, such a thing as Whig, Democrat, or Know-Nothing should not be known; politics should be left outside the gates, and the only question asked or known inside, not to what party does a man belong, but is he a good workman, and does he do a reasonable day's work. Our public establishments, our Dock-Yards especially, are great *political machines,* injurious to the country, dangerous to the communities in which they are, and demoralising in a high degree. Matters have reached such a point, that a man cannot find employment in our public works, unless he be of the "right shade." Recently, before an approaching election, in one of our southern ports, an order was sent from Washington, to discharge certain men, known to belong to the opposite party—not because they were not good workmen, or did not do their work. Now, we maintain that this move was undignified and wrong. It is striking at the very foundation of our political fabric, for there are comparatively few men, who will not be deterred from voting their *honest sentiments,* when they know, that by doing so, their employment will be taken from them, and their wives and children made to suffer. Few men, depending for their daily bread, on their daily labor, have the *moral courage* to brave such an alternative; and, therefore, we repeat, that when a man is discharged for simply exercising his most cherished privilege, in opposition to the ruling powers, a fatal blow is aimed at the very foundation of liberty. Another most pernicious effect of "politics in our public establishments" is, that the men do not do anything like a day's work; the consequence is, the Government work costs double as much as that done in private establishments, and on our stations when the public establishment is larger in proportion to the population of the place, the honest mechanics outside are made to suffer; for if they require their men to do a fair day's work,

they leave them and go to the "Navy Yard" or elsewhere, under Uncle Sam. In Norfolk, a master mechanic cannot do work on the same terms that it can be done where there are no public works; consequently, many things are sent for to be made in other places, which rightly should have been made at home. In a recent ramble through most of our Dock Yards, we were struck with the great number of men we saw idle, and in some cases groups talking together, and where we found one man really working, we saw three idling, the working-man forming the exception. On inquiring why this was, we were answered, "politics" "voters." No master workman or quarterman dare report his men for not working; if he does, he will soon lose his place, for he does not choose his men, they virtually choose him. If an officer is careful to notice and report when he sees the men idling, he soon finds himself detached from his station. We have seen carpenters, joiners, caulkers, painters and others, for half an hour at a time, as long as we could spare time to remain, lying down, engaged in conversation, anything but doing the work they are paid to do. Their quartermen dare not report them to the master workman nor he to the Commander, and he dare not *see* it himself.

We repeat, that inside the gates of our Navy Yards politics should not be known; but instead of this, we have known the bell to be rung an hour before time in order that the men might vote. The Commandant should not know that an election was to be held. If the men wish to vote, let them do it after legal bell-ring, during the meal-hour, or stay out and vote, but on no account let it be *known* inside that an election is going on outside. If this rule is adopted and observed, the public work will be better done and at much less cost, and the mechanics and working men themselves will be better off, and vastly more independent.

Extra Pay for the Gulf Squadron.—We are glad to see a move for this just claim. The reason assigned, which gained extra pay for our Navy in the Pacific—that the expenses there were so much greater—is a well-known mistake. The men lived alike on their rations in both; and for the officers, they were decidedly better off in being necessitated to live wholly on their rations in the Pacific, than those were in the Gulf who could procure mess supplies, but at enormous rates—in several messes exceeding the average monthly pay of the individuals who composed them; while the hardships and dangers with which they had to contend on the Pacific were far less than those brought about by the fatal epidemic of yellow fever in the Gulf. No other reason in the world gave extra pay to those who served in the Pacific than the gold of California, to the gaining of which those who served in the Gulf suffered more and contributed as much.

NEW BOOKS.

Cooper's Naval History, to 1856, abridged in 1 vol., from the octavo edition—Stringer & Townsend, N. Y.—still sustains its high character for truth and impartiality; and it should be a familiar book to every class of readers.

The United States Insurance Almanac, for the current year, is the first of a series "to be continued yearly"—G. E. Currie, N. Y.—and contains a large amount of information under its title, besides a chronology of noted events, banking statistics, &c., &c., of much use to all who would become familiar with the principles and practice of Insurance Companies of every kind.

Commodore Perry's Expedition to Japan and the China Seas, compiled by Francis Hawks, D. D., L L. D., in a large and beautifully illustrated octavo, is just out, and came to hand too late this month for such a notice as we intend to give it.

LITHOGRAPHS.—N. Currier & Co., 152 Nassau-street, N. Y., has just issued another lot of his splendid lithographs:—The clipper ships Sweepstakes, Red-Jacket, and Racer, (this last ship is among the lost); "Heaving-to for a Pilot;" and "Discharging Pilot"—all beautiful specimens of the art.

OUR SPIRIT ON NAVAL AFFAIRS.—N. C - - - - ,—We do think coffee better with cream and sugar in it; but these are luxuries which we do not usually enjoy at sea. Everything in its place, is certainly the best rule to be governed by in all things; and if on some things our taste seems not to mingle the sweet with the bitter, it is surely not because we prefer it so, but the contrary. We would have things as near right as possible; and to this end we are under the absolute necessity of wholly condemning, in the strongest words we can master, whatever tends to too much bitterness in the Navy; and for this, forsooth, we are said to be bitter ourselves on naval affairs! Accused of opposing the Navy, because we oppose abortions, and condemn with all our might what is opposed to its true interests! Surely you would not have us blow hot and cold, at the same time, on the same subject. That we are justly and truly proud of our Navy, from a variety of associations; and that there is much in it to make us so, can hardly require our confessions; but it is not the good that we criticise and condemn. Such are not the subjects which we are called on to treat of. We would have it as perfect as possible, and to this end we hold ourselves as enthusiastically ready to uphold its good points, if attacked, as we are to oppose whatever conflicts with its best interests.

A press of other matter has necessarily crowded out "Iconographic Catalogue" for this month.

DISASTERS AT SEA.

STEAMERS.

British Empire, sunk near Lachine, June 21st, no lives lost.
E. P. Dorr (tug) sunk in Saginaw Bay, July 5th (supposed total loss).
M. Sanford. Boston, for Bangor, Me., went ashore on Thrasher's Island, July 5th.
St. Clair was burnt at St. Louis, July 2nd.
P. Anderson " " "
J. M. Stockwell " " "
Grand Turk " " "
Saranac " " "
Southerner " " "
Northern Indiana, Buffalo, N. Y., for Toledo, Ohio, was burned on her passage, July 17th.
Tinto (prop.) was burnt on Lake Ontario, July 17th. 12 lives lost. Is a total loss.

SHIPS.

Golden Gate, New-York for San Francisco, Cal., put into Pernambuco, in distress, May 19th.
A. Metcalf, New-York for Quebec, was lost near Cape Race, June 9th.
Unicorn, Liverpool, for Boston, was abandoned, June 7th, in lat. 39 N. lon. 57 W.
Neva, Calcutta, for London, was totally lost near Calcutta, May 6th.
Southport, Havre, for Savannah, was abandoned in a sinking condition, May 31st.
Harvard, Calcutta, for Bordeaux, Fr., put into Capetown, C. G. H., in distress, April 24th.
Katardin, New-Orleans, for Vigo, was abandoned at Long Key, June ——.
Souter Johnny, Swansea, Wales, for Caldera, put into Rio Janeiro, with loss of mainmast, (no date.)
Amelia, Cardiff, for Savannah, went ashore near Tybee, July 14th, (reported to have gone to pieces.)
Samuel (Br.) Boston, for St. John, N. B , went ashore, July 14th, on Cross Island, Me., (reported total loss.)

BARQUES.

Lamartine, Baltimore, for Havana, put into Norfolk leaky, July 3rd.
Euphrates, at San Francisco, from London, with loss of some sails, &c.
Chenango, Callao, Chili, for the U. S., put back in distress April 27th.
Parana, Rio Janeiro, for New-York, put into Bahia, Bl. dismasted, May 17th.
Sophia, (Br.) Trapani, for Boston, in contact with the ship Harvest Queen, and sunk, June 18th.
Amazon, Gonaives, for Falmouth, E., struck on Castle Island Reef, near Inagua, June 2nd, (supposed total loss.)
M. B. Stetson, Boston, for Cienfuegos, put back in distress, June 27th.
N. G. Hichborn, Cienfuegos, at New-York, was much damaged, June 18th.
Peter Lenn, (Br.) sprung aleak at Smithville, N. C , July 6th.
Heleos, Ship Island, Miss., for Liverpool, put into Charleston, July 14th, leaky.
G, Whitwell, Valencia, for Quebec, was lost near Frigate Point, Gaspe, July 11th.

BRIGS.

Lubec, Machias, Me., for Boston, put into Rockland, Me., leaky, July 1st.
G. W. Lawrence, St. Jago, Cuba, for Trieste, was wrecked near Cat Island, June 5th.
Geo. Washington, Eastport, Me , for Richmond, Del., went ashore at Cape Island, July 1st.
Gorolamo, (Sard.) New-York, for Vera Cruz, Mex , was wrecked near North Caicos, May 23d,
Selah, Philadelphia, for Portland, Me,, was wrecked in Delaware Bay, July 10th.
Pinta was sunk at East Boston, July 11th
Conqueror (Br.) went ashore near Charlottetown, P. E. I., July 3rd.
Georgiana was abandoned in lat 44, lon. 12, June 6th.
Susan, at Port-au-Prince, was struck by lightning, June 28th (is much damaged).
Columbia, New-York, for Malaga, sunk off the Western Islands, June 17th, (crew saved).

SCHOONERS.

Roswell King, Philadelphia, for Darien, Geo , put into Norfolk in distress, June 21st.
Humming Bird, (Br.) Windsor, N. S., for New-York, put into Portland, Me., June 22nd (much damaged.)
Iris, Annatta Bay, Ia., for New-York. was totally lost, June 11th, on the Jardinnillas Reef.

Hartford, Bangor, for River Head, put into Boston with loss of foremast, July 1st.

C. C. Stratton, Philadelphia, for Savannah, Geo., put into Wilmington, N. C., June 29th, much damaged.

Clark Cotrell, Emerald Isle, for Baltimore, was wrecked near Guayama, P. R., June 7th.

Susan Cannon, Charleston, S. C, for Washington, D. C., went ashore at Sewell Point, June 26th.

Foreigner, Pictou, N. S, for Boston, was capsized in Broad Sound, and sunk July 5th, [crew saved.]

Lioness was burnt at Restigouche, June ——.

Annie E. Cox, Mobile, for Balize, Honduras, was wrecked on the passage, June 1st [total loss.)

Albert, ———, for Boston, was abandoned in a sinking condition, July 9th.

J. B. Dickinson, Philadelphia, for Providence, R. I., sunk near the latter port, July 17th.

LAUNCHES.

At Liverpool, N. S, June 24th, by E. C. Barss, Esq., barque Albacore, of 247 N. M. tons.

At Yarmouth, N. S., June 26th, brig Rescue, of 239 N. M. tons.

At the Marine Railway Ship-yard, Ca., a vessel of 230 tons.

At Mattapoisett, July 2d, by W. Barstow, Esq., ship Huntress of ——.

At Mattapoisett, July 2d, by L. Meig's and Co., ship South Seaman, of 497 tons.

At Gloucester, July 1st, by Messrs. Hardy and McKenzie, schooner ———, of 70 tons.

At Bristol, R. I., July 7th, by Messrs. Thompson, barque Elliott, of 500 tons.

At Kennebunkport, July 2d, by D. & S. Ward, ship Young Eagle, of 680 tons.

At Dorchester, N. B., by John Fredrickson, ship Gen. Windham, of 794 tons, and Sailor's Bride, of 1080 tons.

At Somerset, Mass., July 3d, schooner H. W. Morse, of 180 tons.

At Baltimore, June 24th, by Messrs. Skinner & Sons, barque Dorchester, of 400 tons.

At Fairhaven, July 1st, schooner H. Trowbridge, of 500 tons.

At Searsport, July 7th, by M. Dutch, Esq., schooner Paragon, of 200 tons.

At Fairhaven, July 14th, ship Islander, of 350 tons.

At Baltimore, Md., July 16th, barque Charlotte, of 590 tons.

NOTICES TO MARINERS.

Minot's Ledge, Boston Bay.—Notice is hereby given, that an iron scaffold has been erected on the outer Minot rock, consisting of eight iron piles placed equidistant around a centre one supporting a spider twenty feet above low water. This scaffold has been raised for the purpose of facilitating the operation of building the light-house tower now in progress.

The entire structure is painted red, and should be seen from the deck of an ordinary coasting vessel from six to eight miles by the naked eye.

By order of the Light-house Board.

June 30, 1856.

Princes Channel—Entrance to the Thames, England—Additional Light.—Official information has been received at this office, that it having been determined that, for the better navigation of the Princes channel, an additional light shall be exhibited therein, notice is hereby given, that, previously to the 1st October next, a light-vessel will be moored on the north side of the said channel, about midway between the Tongue and Girdler lights, and that a *red* revolving light will be exhibited therein on and after the evening of that day.

Further information respecting the exact position, bearings, &c.. of the said intended light, will be published in due course. By order of the Light-house Board.

July 1, 1856.

Light-house at the Mouth of the Pasquotank River, North Carolina.—Information has been received at this office that a screw-pile light-house has been erected on the extremity of the shoal making out to the eastward from Wade's Point, at the mouth of the Pasquotank River, North Carolina, from which a fixed light will be exhibited on the evening of the 20th inst., and on each succeeding evening thereafter, from sunset to sunrise. The structure is painted white, surmounted by a lantern painted red. The light is 30½ feet above the level of the water, and should be seen under ordinary states of the atmosphere, from the deck of a vessel, from eight to ten nautical miles. The temporary light will be dispensed with on and after the exhibition from the new structure.—*U. S. Treasury Department.*

Buoys at St. Andrew's Inlet and Sound.—The Buoys at St. Andrew's Inlet and Sound have been arranged in the following manner:

Bar Buoy is a second class can, painted red, with the No 2 in white; is placed in sixteen feet water at low tide, and must be left on the starboard hand entering. Little Cumberland Light bears W. by N. ½ N.; South Point of Jeckyl N. W. by W.

Middle Buoy is a second class can painted red, with No. 4 in white: is placed in nineteen feet water at low tide, near the high North Breakers, and must be left on the starboard hand entering. Cumberland Light bears W. by N. ¾ N.; South Point of Jeckyl N. W. ½ W.

Inner Buoy is a second class can, painted black, with No. 1 in white; is placed in twenty-one feet water at low tide, near a dry shoal, and must be left on the port hand entering. Cumberland Light bears S. W. by W. ¾ W.; South Point of Jeckyl N. W. ½ W.

In the Sound is the Middle Ground Buoy, a second class can painted with red and black horizontal stripes; is placed in ten feet water at low tide, on a point of shoal running down from the Satilla River and nearly in the middle of the Sound. Vessels must not pass to the westward of its Cumberland Light bears S. by E. ½ E.; inner Point of Jeckyl N. W. ½ N.

Buoy at the entrance of Satilla River is a second class can, painted black, with No. 3 in white; is placed in ten feet water at low tide, and must be left on the port hand entering the river. Cumberland Light bears S. by E.; outer Point of Jeckyl N. E.

Note —In running in for St. Andrew's Bar, bring the Light to bear W. by N. ½ N. while in four fathoms water This bearing as a course will take you up to the Bar Buoy; then haul to the northward, until the Middle Buoy No 4 is in range with the Light, (to avoid two lumps, in a direct line W. by N. ½ N. between the two Buoys,) when steer for it, passing it to the southward. From this Buoy a N. W. by W. ½ W. course will take you into the Sound.

By order of the Light-house Board.

Charleston, S. C., June 26, 1856.

Buoys at St. Simon's Inlet and Sound.—The Buoys at St. Simon's Inlet and Sound have been arranged in the following manner:

Outer Bar Buoy is a large first class Nun, painted red with No. 2 in white; is placed in 20 feet water at low tide, and must be left on the starboard hand entering. St. Simon's Light bears N. W. by W. ½ W.; north point of Jeckyl W. by N. ½ N.

Middle Buoy is a second class Nun, painted black with No. 1 in white; is placed in sixteen feet water at low tide, on the Eastern edge of the middle ground, and must be left on the port hand entering. St. Simon's Light bears N. W. by W. ¾ W.; North Point of Jeckyl bears W. by N.

Inner Buoy is a second class Nun, painted black with No. 3 in white; is placed in 21 feet water at low tide, on the point of shoal running off from Jeckyl Island, and must be left on the port hand entering. St. Simon's Light bears N. E. by N. ½ N.; north point of Jeckyl W. by S. ¾ S.

In the Sound is the Lower Middle Ground Buoy, a second class Nun, painted with red and black horizontal stripes; is placed in twelve feet water at low tide, on the lower point of the Middle Ground, to mark the two channels St. Simon's Light bears N. E. by E.; north point of Jecky S. E. by S. ½ S.

Middle Ground Buoy is a second class Nun, painted red with No. 4 in white; is placed in eighteen feet water at low tide, near the elbow of the Middle Ground, and must be left on the starboard hand entering. North point of Jeckyl bears N. E. ½ E.; Brunswick Point W. by S.

Upper Middle Ground Buoy is a second class Nun, painted red, with No. 6 in white; is placed in eighteen feet water at low tide, near the upper end of the Middle Ground, must be left on the starboard hand entering. Brunswick Point bears W. ¾ S.; mouth of Jeckyl Creek bears S. ½ E.

Note—In running in for St. Simon's Bar bring the light to bear N. W by W. ½ W. while in four fathoms water. This bearing as a course, will take you up to the Outer Bar Buoy and into the Sound, passing the buoys as directed.

By order of the Light-house Board.

Charleston, S. C., June 26, 1856.

The American code of Marine Signals adopted by the United States Navy has been supplied to the following Magnetic Telegraph Stations:—Wood's Hole, Holmes' Hole, Chatham and Provincetown, to facilitate communication with passing vessels.

Light at the Narrows, Boston Harbor.—A screw pile light-house has been erected on the spit abreast of the Narrows, Boston Harbor.

The house is a hexagonal building, painted a dark brown color; is elevated on seven iron piles and surmounted with an iron lantern.

The light is designed as a guide to clear the spit by vessels passing through the main ship channel.

On the night of the 1st of August next, and every night thereafter, it will be illuminated with a lens light of the 6th order, elevated 35 feet above high-water mark.

By order of the Light-house Board.

Boston, July 15, 1856.

Buoy on the Reef north of East Sister Island, Lake Erie.—A span Buoy, painted black, and bearing a white flag, has been placed in eighteen feet water, on the north side of the reef lying north of East Sister Island, Lake Erie.

By order of the Light-house Board.

Buffalo, June 23, 1856.

Dangerous Rocks.— Capt. Guy, of the Br. schr. Neva, at Liverpool, reports having seen two rocks about four feet above water, in lat. 31 30 N. 34 48 W.

Captain Timm, of the barque Anna Isabella, at San Francisco, 3d inst, from Valparaiso, reports that he passed in the latitude and longitude of the Island of Paraxas, or Bird Island, (which is laid down in the chart in lat. 26 N. and between lon. 135 and 136) and was unable to discover them. He states that his chronometer was perfectly correct, and also that the weather was perfectly clear when he passed the latitude and longitude indicated on the chart.

Port Philip Bay—Light Ship, West Channel.—In accordance with a notice issued from this office, dated the 20th Feb., the light ship has been moved about half a mile S. by W. from her former position, and now lies moored in about 19 feet water, with the following bearings :—

Upper Light-house, Shortland's Bluff, S. 35 W.

Extreme part of indented Head, N. 39 W.

Summit of Arthur's Seat, S. 35 E.

White cone Buoy on western elbow of Williams' Sound, 22 W.

Black cone Buoy on Swan Spit, S. 24 W.

Black and white checkered Buoy on 13 feet knoll, distant from light ship about a cable's length, S. 26 E.

Mariners are further requested to take notice, that with the view to facilitate the safe navigation of the West Channel at all times of the night and tide, a Floating Light vessel (the equipments of which will be completed in a few weeks) will be moored off Swan Spit, in the position at present occupied by the Swan Spit black Buoy, and the latter removed. This vessel will exhibit a single fixed light.

On the exhibition of the light, the upper light on Shortland's Bluff will be darkened from N. E. by E round northerly to W. by N. and the two checkered Buoys now lying mid-channel above Swan Spit will be removed, and the position of the knowls they mark pointed out by beacons on shore.

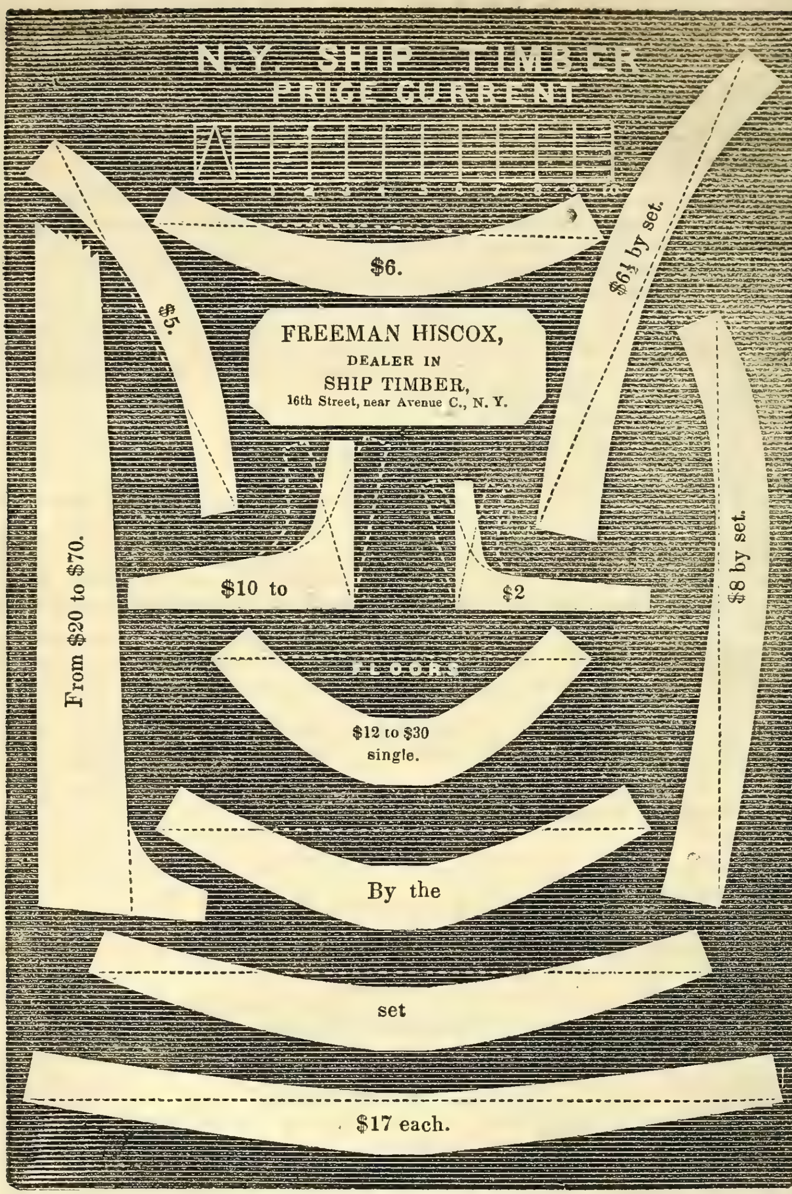
Due notice of the night on which the light will first be exhibited, together with full particulars ef the above changes, will be hereafter published. The depths are at low water spring tides; boarings by compass.

CHARLES FERGUSON.
Chief Harbor Master,

Chief Harbor Office, Williamstown, April 1, 1856.

SALES OF VESSELS.

Barque Chenango, built at Baltimore, in 1841, 328 tons, at auction at Callao, May 9th, for $4,500.
Barque Rapid, 330 tons, 2 years old, at New-York, for $16,500, cash.
Brig Abrasia, at auction, June 13th, at Bermuda, for £90.
1-16 of Barque Fanny, at auction, at New-Bedford, at the rate of $12,100.
⅗ of ship Massachusetts, at auction, at New-Bedford, at the rate of $7,100.
Schr. J. P Ross, 127 tons, built at Camden, N. J., at Providence, for $1,335.
Schr. Alice Grover, at Buffalo, June 21st, for $8,000.
Schr. Clark Cotrell, (wreck) near Porto Rico, was sold for $360.
Schr. E R. Sawyer, 126 tons, for $——.
Schr. Alfred, 185 tons, for $3,800.
Brig Marcellus, (wreck) at Nassau, for $542,88.
27-32 of ship Hibernia, 551 tons, at auction, at New-Bedford, July 8th, for $7,850.
Schr. Atlantic, of 130 tons, built at Long Island in 1849, for $4,500 cash.
Schr. C. F. A. Cole, at Baltimore, for $2,275.
3-16 of ship Lady Franklin, built at Williamsburgh, L. I., in 1850, 1,283 tons, at auction, at New-York, July 16th, for $8,500.
5-48 of ship Star of the West, built at Williamsburgh, L. I., in 1850, 1,122 tons, for $3,000.
Schr. Morning Star, 41 tons, 8 years old, for $1,200, cash.
Schr. Triumph, 60 tons, at auction, July 18th, for $815, cash.
1-8 of ship Samuel Robertson, of Fairhaven, at auction, July 19th, for $1,000.
Ship Bowditch (whaler) 399 tons, at auction, at Warren, July 17th, for $4,250.
Barque M. Kimball, built at Belfast, Me., 3 years old, 550 tons, for $21,000.
1-12 of ship Hungarian, built at New-York, 2,000 tons, for $3,500.



A set floors and futtocks, $9 each. Oak Flitch, 30 cents per cubic foot ; oak plank, $36⅔ to $40 per M ; deck plank, $35 per M. ; hackmatack timber, 25 cents per cubic foot ; chestnut, ditto ; cedar, 30 to 50 cents : yellow pine timber, rough, 35 to 45 cents per cubit foot ; ditto, sawed, $28 to $30 ; yellow pine plank $27 to $30 per a

Oak Knees—5 inch $2 50 ; 6 inches, $5 ; 7 inches, $7 ; 8 inches, $10 ; 9 inches, $12 ; 10 inches, $15 ; above, $1 50 per inch.

Hackmatack Knees—5 inches, $1.50 ; 6 inches, $2 50 ; 7 inches, $4 25 ; 8 inches, $6 00 ; 9 inches, $8 ; 10 inches, $9 00 ; above, $1 per inch.

THE

U. S. Nautical Magazine,

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THE DANGERS OF THE SEA.

THE ocean has ever been regarded as the uncompromising foe of all who furrow its trackless depths. This globulated element has been from time immemorial the winding sheet of the unfortunate mariner, and the grave of the reckless adventurer. The dangers of the sea (so-called) have been the dread of commercial men in every age. So accustomed have mankind become to survey the dread, fearful, and stereotyped list of entailed misery and bereavement, that the whole civilized world regard the loss of life and property at sea, as a tribute or duty exacted of necessity, like the *Danish Sound Dues*—a kind of primogenial inheritance, to the payment of which all the world should quietly and peaceably submit. Fortunately for commerce, there are a few persons who dare lift the mysterious veil, and look beneath the surface of things. Since the time when the Phenician mariner doubled the stormy cape, to brave the dangers and secure the advantages of commerce, the sea has been instinctively the dread of the Chinaman, and intuitively the terror of the Egyptian. From that distant day to the present, the commercial world has yielded a willing obedience to the mandates of the mighty deep; the hoarse whispers of the storm have been the signal of triumph and tribute to the lubric wave. Shall it always be so? Shall all mankind continue to be hushed into silence at this monstrous absurdity, entailed by the hereditary customs of a barbarous age? Shall we continue to lull ourselves into this fatal security? Shall the budget of *dangerous entailments of the sea* continue to be regarded as too great to enumerate, too difficult to determine? The mother tells the lisping infant of the terrors of the storm. The father recounts incidents of travel, and to discourage seaward tendencies, magnifies the stormy billow to his son, while the master enlarges upon the dangers of the sea to his class.

Thus the public mind has become imbued with the idea, that to the "dangers of the sea" must be attributed all the mishaps which may occur to a vessel, when upon a sea or coasting voyage.

Since the days of *Jason*, there never has been a time when adventurers were not ready to dare the dangers and brave the perils of the sea, when under the powerful attractions of the "*Golden Fleece*." It is one of the most remarkable features in the nautical commerce of the world, that its interests should not have been so far considered, as to secure a catalogue of those perils in navigation, which have from time immemorial been denominated the "dangers of the sea." It is indeed most surprising, that underwriters have never so far consulted their own interests, as to determine the boundary line dividing the *dangers of the ship from those of the sea—referring the ship's dangers to another and more appropriate board of insurers.*

In our last issue we published the first of a series of articles on the "dangers of the ship," then announcing, that of the aggregate of ocean loss, nearly one-half was directly attributable beyond dispute, to the "dangers of the ship." In that article as in this, a few only of the more prominent features were exhibited, leaving the bulk of the *exposé* to be made at a future time.

We shall now furnish a general outline of what may properly be denominated the "dangers of the sea." In examining this subject, something more will be required than a mere mechanical exposition of the difficulties attendant upon maritime pursuits, and yet nothing beyond a common sense view. It is not while the ship is sustained by the buoyant, non-compressible and equilibriating molecules of the fluid in a state of rest, or while floating upon the ebbing and flowing tide of a harbor, that she encounters those untold perils; it is not from the ceaseless pulsations of the tide-wave, upon the broad bosom of the ocean that dangers multiply, nor yet singly from the storms which pervade the preponderating mass of waters which cover so large a proportion of the globe. The great Architect of the Universe has adapted the ocean to the wants of commerce. Who dare deny it? The storm is not less essential to commerce than the calm. What do we know of the ocean or its laws? Scarcely the alphabet of its philosophy. What can we know of its use until we understand its laws? Scarcely has a *Maury* began to map out its declivities, to note its soundings, and give the configuration of its reefs; to calendar the throbbing of its tides, and the latitude of its prevailing storms, when the *lullaby of perfected science* mantles expectation for the future, and an apathetic calm pervades the nautical world.

It is a truism which may not be questioned, that men of science have scarcely attained a position, the altitude of which, is sufficiently elevated, as a stand point, from which an investigation of oceanic laws can be determined, or made available to the world; and yet much has been gained, and much more will have been gained, *when only a foundation for this pharos of the globe shall have been constructed.*

Without attempting to penetrate into the mysterious depths of the sea, we may find enough of stultified ignorance floating upon its surface to freight the commerce of the world with *shame*, for this blind adherence to the customs of the barbarous ages of *antiquity*. We see the ocean wave, but what do we know of its laws of motion, or of its destructive power. Why is it that seamen generally, are so completely ignorant of the very first principles which govern the *ocean wave? Why is it that ship-masters are so far from home in their own element, when the subject of waves is broached among men, who learn to investigate, as well as look upon what is before them?* The man of science smiles at the credulity (and well he may, whether he has ever been at sea or not) of the master of one of the finest ocean steamers in the world, when he tells of the sea running fifteen knots per hour, and still farther enlightens his auditors, by informing them that his steamer could only make headway at the rate of five knots against this tremendous sea. We should not be unmindful of the fact, that for this same steamer, only thirteen knots was ever claimed in fine weather, with a smooth sea; and that the opposing power of the wind was, perhaps, too insignificant to be brought into the account, although the distinguished commander must have had some faint idea that this "tremendous sea" was caused solely and entirely by the wind.

Before we enter upon an exposé of the consequences of this entire absence of affinity in philosophy and practice, it may be well to furnish an abstract of the principles which govern the ocean wave, which is the needless dread of the nautical world, when it shall have conformed to its laws.

A wave is the progress of the shape, and not of the water, as many suppose. When the motion is not progressive, the formation is that of a *free wave;* when the motion is progressive, it is very properly termed a *forced wave*. When speaking of waves, this distinction should always be made.

By careful observation of the free waves of the open sea, we shall discover that the movement is not, as many have imagined—that in each elevation, a quantity of water equal in bulk to that of the wave, or that the wave itself, was advancing in the direction of the wind. Any light substance floating on the water, will show that it is not moved progressively or horizontally. If watched carefully, it will be found that the apex of the wave only moves in the direction of the wind, and in the *opposite direction* at the hollow of the wave, or in common parlance, the trough of the sea—the advance and egress sensibly balancing each other.

To any careful observer it will appear as a visible fact, that the continued motion of a free wave in one direction is not a continued moving of the water in that direction, but may be ascribed to a continued motion of a *shape*, or an arrangement of *the particles of the* water. This is consequent upon an inherent property in the law of equilibrium of fluids, which makes each particle independent (in a certain sense and to a certain extent) of the other. Part

of this is consequent upon the globular form of those particles which render the facility of motion most complete; and, indeed, much more so than that of any other body in nature, while it adds greatly to its *momentive power*, which causes the forced wave, when unbalanced, to strike with such destructive force.

Water acts as a motive power, whether for propulsion or resistance, either by its weight, its momentum, or by its pressure. Its facility of motion, consequent upon its equilibriating properties, renders its surface susceptible of being affected by the slightest pressure—the inequality of which changes it both in appearance and reality, from the smooth, glassy, placid, and almost level sheet, to the rugged billow of fearful frown. No depression can take place on one part without a corresponding elevation in another; nor can the wave harm unless the wind, the ship, shoal, or shore interrupt this motion. If the pressure of the wind were vertical, we should have Maelstroms instead of seas. The penetrating properties of the wind striking into the interstices between the molecules of the fluid, furnishes an adhesive quality by which friction is engendered, and by the means of which the water is heaped up into waves; we may readily discover the effect of the wind passing over a sheet of water, by first noting its effect upon the unshielded surface, and then pouring oil upon it, when it will be discovered that the wind is comparatively powerless upon the oiled surface, the small interstices having been filled up and coated over with oil.

If the wind were always of a determined force and extended over the entire ocean, the altitude, direction and force of the sea would be always the same; but for the same wise purpose for which intended, does the wind blow from different directions with greater or less intensity, and at different times, that all the various voyages may be prosecuted at the same time. In the passage of the wind over the surface of the ocean, we should remember that the force of gravity is not suspended, and the weight of the atmosphere is constantly acting; consequently, where the wind blows the strongest the greatest pressure is exerted downward, causing an elevation in advance, the weight of which equals the pressure of the wind. This elevation in turn, is exposed to the action of the wind, and this pressure transmits the motion in a direction at right angles with the plane upon which it acts; but this motion may be increased until the elevation above the surface and the depression below the surface, together, equal the weight of a column of air balancing a column of mercury of twenty-eight inches, beyond which it cannot go. It may not be out of place to inquire what is this altitude beyond which an ocean wave cannot rise: In brief we say, that it is thirty-two feet, or sixteen feet above the mean level; and this is the mountain wave of which we hear so much—equal in absurdity, and corresponding in magnitude, to the progressive motion of "fifteen miles an hour."

Infinite wisdom has thus set bounds to the ocean, beyond which it cannot pass. How unwise, then, to elaborate so largely on the dangers of the sea, without first knowing what they are!

The wedging or elevating power of the atmosphere upon the surface of the ocean being lost at thirty-two feet, it follows, as a consequence, that the wind would serve to blow down or depress, rather than raise it, were it possible for it to raise above that height; and although this fact has been known more than two hundred years, yet it would seem that navigators and nautical mechanics scarcely believe it, notwithstanding they see the fact in the mercury balanced at twenty-eight inches before their eyes—mercury being fourteen times heavier than water, and twenty eight times fourteen inches equal to thirty-two feet—the greatest altitude a sea can possibly be raised by the power of the wind, and this altitude is measured from the hollow, and not from the mean surface, which is but sixteen feet. But it does not follow that the rise or fall of the bow or stern of a vessel may not far exceed this; and we believe it possible to so construct a vessel, that this motion of the sea alone would destroy her; but this would not be from the dangers of the sea, but from the dangers of the ship.

In order to know the real dangers of navigating the ocean, it will be necessary first, to inquire, what makes the ocean more dangerous in storm than in calm? This may be regarded as one of the simplest questions, and yet, if we may judge from what we see, few can answer it correctly. It is a plain problem, that the motion of the water causes a motion of the vessel, but do they correspond? Is not the motion of the vessel sometimes greater than that of the sea? and may it not, and should it not always be less, are questions worthy of an answer. We shall endeavor to dispose of them in accordance with the principles of philosophy. The laws of flotation are plain in themselves—a body displaces a bulk of water, the weight of which is equal to the weight of the vessel. It must be plain to every mind, that the pressure upon the vessel differs in a given ratio, proportionate to the depth below the surface—the greatest aggregate upward pressure is at the greatest transverse section, where the smallest proportionate weight of vessel is found; and the least amount of pressure is also found at the same point where the greatest weight of vessel is to be sustained. Now with this preponderating force of gravity on the extremities, is it surprising that the ends of the vessel by this momentive power should fall deeper than their proper line of flotation. Does this redundancy of longitudinal motion belong to the dangers of the sea? We say no. Floating bodies approximative of the vessel's form, which have no projection above the surface, are not forced onward in the direction of the wind, unless propulsory power is applied for such purpose. A *catamaran*, or a dismasted vessel, so far sunken as to be free from the influence of the wind, actually works to windward, showing conclusively that the regressive power in the hollow or trough of the sea is stronger than the progressive motion at the apex. Hence we discover that the wind and the ship furnish greater cause of alarm than the sea; and that if the distinguished master had applied his remarks to the wind

instead of the sea, they would have been more in consonance with both theory and practice.

It may be asked, why does the ocean prove more disastrous to vessels than the bay or river? We answer, because of the greater extent of surface. The mass of water raised from the surface of the ocean demands a corresponding amount of wind as a propelling power, else the rain clouds would fail to irrigate the earth ; but while the rain-cloud navigates but one element, it adapts itself, by a law of nature, to that element, while the mariner may be said to partially navigate two elements—both wind and water, with his vessel not properly adapted to either. Who will say that the top-sides of the hull, with the spars and rigging, are adapted to the wind storms of the Atlantic Ocean? We think there are few, if any. If we make an improvement in the lower part of the hull, we forget the top-sides. If we attempt to make a clipper top-side, it is to deceive the freighter, purchaser or passenger—unmindful of the immersed part, or the momentum of the propelling power. It cannot be doubted that the present system of arranging and distributing the propulsory power, has a great tendency to aggravate the projected wave around the anterior part of the vessel.

We have no doubt that many an otherwise fine ship has been wrecked from no other cause than that of non-conformity to the laws of the ocean wave. What egregious folly to suppose, that by conforming to a law for the measurement of tonnage, we can secure adaptation to the ocean wave. *Was there ever so great an absurdity practised in the world, in any age, in any country, as that practised by this great commercial nation* in moulding ships by a law, made before this law of the ocean wave was fully known, and made by men who knew no more of the ocean's laws than they did of Noah's Ark.

England, with all her hereditary notions in commerce, although her government framed the law of tonnage, has twice been ashamed of it, and has as often improved it. But, alas for progressive America, she adheres to it still—at a cost at least of ten millions of dollars, and thousands of lives annually. But who is chargeable for the dangers of the ship, growing out of the tonnage law? *We think it is chargeable, in some measure, upon the Underwriters and National Legislators of the United States.* If the Board of Underwriters made a distinction in their rates of premium for insuring ships, then would ship-owners flood the halls of Congress with petitions for an equitable tonnage law, and progress would at once take the place of precedent.

The causes of so many disasters at sea may be classified thus: First, the want of an elementary shape for vessels. Second, the momentum of the ends and sides of the vessel, when set in motion by the sea. Third, the want of adaptation in the propulsory power to the peculiarities of model, thereby adding to the momentive power applied to the sides and extremities. These three divisions may be sub-divided into as many more, and each would form the substance of an article.

When, by the adoption of an equitable tonnage law, these departments shall have been brought within the jurisdiction of science and art, the dangers of the sea will not be added to those of the ship, to mantle families and friends with the tokens of bereavement; the dangers of the ship will be cared for in part, by the owner and builder—and the dangers of the sea will have a defined catalogue, within the reach and comprehension of owners, builders, and underwriters—an auspicious era for the commerce of the world, and yet were the proper means adopted, it might be fully attained within the next five years. Who doubts it?

RESPONSIBILITY IN THE NAVY.

We have long regarded the disposition, so abundantly manifest in every branch of the Naval service, to avoid responsibility, as one of the greatest hindrances to an improvement of its condition. Were this disposition only to be found in a single branch of the service, the error doubtless would long since have been corrected. Where it first originated we shall not now pause to inquire, nor is it important. It is enough for us to know that it is found in all the gradations of rank, as well as in those departments which give utility to the Navy, and yet are without rank. There can be no such thing as efficiency in the Navy unless each individual feels himself identified with some obligation, in addition to the obedience of an order given him by one of superior rank. Every officer, of whatever grade, should feel that he alone is responsible for the efficiency of the act he is directed to perform, both in the spirit as well as in the letter of its fulfilment. The dignity of the Navy is not unfrequently as much identified with the *manner* in which an officer carries out his instructions, as in the letter of those instructions. No man can enjoy the blessings of good government unless he himself performs the duties it enjoins upon him. In the merchant marine this fact is well understood. If the merchant has a ship built, he holds one individual only responsible for the efficiency of the fabric to be constructed. The merchant adapts the size of the vessel to the amount of capital he is able to invest—a contract contains the letter of instructions, while the reputation of the builder shields the spirit of his obligation. It may be remarked by an adherent to the present system, that if the private ship-builder values his reputation so highly, why does the obligation it enjoins sit so lightly upon him when engaged in the public service? In answer we would say, that he finds the prevailing custom in the Navy to be adverse to the assumption of his prerogatives, and rather than share the honors which of right belong to him, he submits to the dictation of others, and has almost invariably found, that when the hour of trial came, he is made the *scapegoat* to bear the sins of others. The vitality of an aspiring

ship-builder's ambition is destroyed when he loses the control of that which comes within the orbit of his peculiar province, and he at once seeks to regain his lost equilibrium by striking a balance in dollars for his lost reputation. It has at length become hazardous to the reputation of any nautical mechanic who accepts a contract from the Navy Department. However well deserved a reputation he may have earned, he is almost sure to come off second best, though the service to be rendered may be that which he has performed perhaps fifty times, and in each case with credit to himself. By this means the Navy has been brought into disrepute among the best informed men in the country, as to its real efficiency.

If a ship is to be built by a Naval constructor, he cannot receive the order direct; he is but a secondary party to the service required. If a ship is to be surveyed, the Naval Constructor is the second or third man on the list of those appointed for the service; he performs that service, because those above him do not know how, while they wear the honors. This would be very well, provided they bore the blame when any thing goes wrong. If a ship is to be taken in or out of dock, or if a ship is to be launched, the order is given to the Commandant, while the Constructor does the duty. If the service is successful, the Commandant did the work—he is *responsible;* but if the work is not as complete as it should be, the Constructor bears the blame. If a commission is appointed for any purpose within the range of mechanical pursuits, a naval officer heads the list; while the constructor or the engineer must do the work, make out the report, and bear the censure for whatever is wrong. With such an inequality of burdens and honors, is it a matter of surprise that no one is to blame for the blunders of the Navy? The officer makes no pretensions to a knowledge of mechanism or engineering when there is responsibility to be borne, and yet he is quite willing to take the command and wear the honors, in fine weather, while in seasons of difficulty and doubt he is not responsible. The Naval Constructor of a Navy-yard, who should have the entire control of every man employed on or about the hull of all vessels, cannot employ or discharge a single man, no matter how necessary; he must ask and obtain the consent of the Commandant. What a farce!—Will it always be so? We hope not.

With such a state of things, who wonders that no one is blamable for the failure of an enterprise! Who feels the burden of responsibility? The Commandant cannot, surely, because it is not within the line of his profession; the Constructor cannot, because he is only obeying orders, and has no rank or reputation to inspire his genius and prompt his ambition; he very naturally inquires: Why was I, a subordinate officer, not recognized at the Department, compelled to pass the strictures of a Board of Examiners, while he, from whom I receive all my orders, maintains the highest rank in the Navy without even the shadow of an examination, or even a superficial

knowledge of mechanism. With these one-sided reflections he becomes indifferent to the spirit of the orders he receives, and loses his ambition for improvement, if he ever had any, and, like the line officer from whom he receives his commands, endeavors to place the responsibility where it belongs; neither being willing to be accountable for the faults of the other. It may be said that the Commandant must obey orders. This is true; but by what act of Congress was a Naval constructor made subservient to the will of a commandant? A naval constructor is a civil officer, and is entitled to the entire command of a Navy-yard for all the purposes of construction and repairs, the grand and only object for which he was appointed. Why did Congress, by the act of 1842, abolish the Board of Navy Commissioners and establish a Bureau of Construction, placing at its head a skillful naval constructor? Was it that they should be outranked by officers of the line? Certainly not. It was because they considered the ship of more importance than the rank of the man who was to command her. But why has this great error been tolerated so long, and why does it continue to increase in magnitude? Simply because the line officers are many, and the naval constructors are few. If Commandants of Navy-yards were not disposed to assume powers to which they are not entitled, they would send the letter from the Department containing instructions for the constructor directly to him, to be entered on file by himself, and carried out, instead of filing it, and then giving a sub-order to the constructor. Were the Commandant to do as he would be done by in this matter, he would not become a party to the wrong; but as it now is, he nourishes and perpetuates this relic of the Board of Navy Commissioners, kept in force by those line officers who held positions as Chiefs of the Bureaux, in the face of the act of Congress requiring skillful naval constructors. A naval constructor, if worthy of the office, is second only to the Chief of the Bureau, and is the most important man in any Navy-yard, and should receive his orders direct from the Bureau of Construction. If it is essential that a Navy-yard should be officered as the flag-ship of a squadron (which we very much doubt), the Naval Constructor is, by the act of Congress, no more subservient to the orders of the Commandant of a Navy-yard than the ambassador of a foreign court who takes passage on board the flag-ship; both receive their orders from higher powers. The Naval Constructor commands the ship until completed, when the Commandant controls her until the voyage or cruise has been completed. The yard has been prepared for mechanical purposes, and a mechanic has been empowered to conduct them.

But there is other, and, if possible, still higher grounds from which to compute the amount of absurdity in the present order of things. Of the moneys appropriated by Congress for construction, repairs, and equipment, the Naval constructors have within their province the expenditure of 66 per cent.; consequently it is no exaggeration to say, that this proportion of the honor

and reputation, at least, gained by the construction of this floating fabric, belong to them. The ratio of responsibility for putting a ship of war in readiness for active service is as follows:

Construction, - - -	66.3	Provision and Clothing, - -	3.2
Equipment, - - - -	17.7	Hydrography, - - - -	4
Ordnance, - - - -	12.4		
			100.0

However much may be said about rank in the Navy, the Hon. Secretary is a civil officer, and his cabinet or counsellors are the Chiefs of the Bureaux, who will doubtless be regarded as being above the grade of line officers. It follows, as a sequence, that all the Navy-yards are sub-bureaus, to be controlled, in conformity with the act of Congress of 1842, by skillful naval constructors, and upon no other principle can the spirit of that act be maintained. The idea of making one naval constructor subordinate to the line officer, while another without superior qualification in commission or merit, outranks the entire line, and is second only to the Hon. Secretary, is not in conformity with either the spirit or letter of the law of Congress. It was a wise provision in the organization of the Navy that every officer of the line should pass from the lower to the higher grades; the result of which is, that the Commandant is not only expected to be conversant with the duties and responsibilities of his own rank, but of all the minor grades, having himself passed through those grades; and if it were necessary, he could perform the duties belonging to every subordinate grade. But how strangely awkward would a commandant appear endeavoring to fill the place of a naval constructor. Hence, we say that if there must be analogy in the command in our Navy-yards, like that of a squadron, the constructor should have the highest rank; because he has the most responsible position, and because there are no line officers below him who can perform his duties. Unless this act of justice is meted out to the naval constructors, it is impossible to hold them accountable for the blunders in this department. When this is done, then a naval constructor can be held responsible for the sea-worthiness of a ship of war passing out of his hands. An unseaworthy vessel, like the Porpoise and Hancock which had to be repaired at the Cape of Good Hope, and at Hong Kong, because of their leaky condition, although direct from our Navy-yards, at an expense quite sufficient to build an entire new vessel, would be unknown; and if our naval constructors are only employed to repair vessels, there being but few built, they would be responsible for the stability and efficiency of those repairs, and for the consequences of failure, which now belongs nowhere.

Here is a case in point. Who launched the Roanoke? If the launch had been a successful one, the Commandant would have been the person; as it was, he hands it over to the Constructor, and he uses the slip that had been built before he went there. The Engineer built the slip; where is

he? Interrogate him, and what does he say? Why, he tells you that when the ship was built there were no steamers in the Navy, and he in his judgment adapted the launching slip to the Navy as it then was, without reference to what it was to be. And thus the matter ends, no one is to blame; and this will always be so while line officers have the control, to the smallest extent, of mechanical operations.

FIRE AND STEAM.

THE REMEDY.

To the Editors of the U. S. Nautical Magazine and Naval Journal:

SINCE the introduction of steam vessels, the press has teemed with accounts of the dreadful conflagrations, explosions, and collisions, with the great destruction of human life and property. The press and pulpit have thundered against these calamities, and have characterized them as enemies, but they still go on; the groans of the dying and wounded have gone up against them from every corner of our land; but they do not cease. The loss of the steamer Northern Indiana on the 17th July on Lake Erie, by fire, with the loss of many valuable lives, and a large amount of property, induces me to investigate the cause, and remedy, and place them before the public. The cause is too well known to need much comment. From the engineers' story, the fire originated about the boilers, or steam chimney. To say nothing about the arrangement of the boat in regard to fire, we will proceed to the remedy. First; stop the engine to prevent a draught of air of 17 miles per hour, in a calm, which is the cause of all boats burning so rapidly, and the burning of the after part of the boat first. Second; the engineer and other officers should command order, and apply all the fire engines at once, which will put out any fire, in our opinion, on board of steamboats, when there is no draught of air to cause the fire to rage or spread.

The most certain remedy of putting out fires on board of steam-vessels, is the blowing of wet steam from the boilers with tubular steam pipes running through all parts of the boat, with openings to blow out wet steam wherever the fire might originate, with rods of iron leading from the different blow-off cocks to the bow of the boat, where there is no danger of fire, in order to blow-off steam into that part of the boat that may be on fire, without risk to the passengers. The rods, with levers attached, to open the blow-off cocks to be encased, and locked up; the captain, mate, and engineer to carry the keys.

In case of fire the engine should be stopped, unless blowing a gale ahead, in which case the boat should be put before the wind in order to produce a calm. The wet steam to be blown into that part which is on fire, by the

first officer that reaches the blow-off levers with a key; due notice being given to the passengers, by printed cards in different parts of the boat, that wet steam will be blown into that part of the boat which is on fire, in order that there may be no alarm among the passengers. It is a well-known fact that wet steam will put out fire, and never has failed, when blown into the location of the fire on board of steam-vessels; and steam-vessels always have, when under way, the steam at hand to put out fires in all parts of the boat, by the above arrangement; and no sane man will presume to say that they will not be used when the levers that open the blow-off cocks are placed forward—the last part of the boat that burns, in all cases.

Let us now search a remedy for the loss of life and property in case of a collision, snags or rocks; for such accidents will take place, notwithstanding all the laws that has or may be passed to prevent them. In order to accomplish that object, let us make the vessel itself a life-boat, by building her with longitudinal and transverse bulkheads of boiler iron, water-tight, forming from 10 to 30 compartments, according to the size of the boat, which will give much more strength to the vessel with less expense, and much less weight than any other mode of construction. The ship would then be a life-boat, beyond all contingency, that could not be sunk or lost under any circumstances. In case of two or three collisions on a voyage, that would fill that number of compartments, she would have ample strength, flotation, or buoyancy remaining, to carry her safe to her port of destination, with her valuable cargo of human beings, without the slightest risk to life or property.

In regard to explosions, in our opinion the cause is a lack of water in the boilers. No boilers ever blew up with a flush of water in the middle or upper cock to our knowledge during thirty odd years' steam-boating. The remedy—care and a practical knowledge of the business.

H. Whitaker.

[For the United States Nautical Magazine and Naval Journal.]

YACHTING.

Messrs. Editors,

May I take the liberty of asking you a few questions, in answering which you will greatly oblige a subscriber, who is yet an apprentice. The questions which are given below, concern the model of a yacht, which I have made, and is intended for a fast craft, but having no experience whatever, I should take it as a great favor if you would be kind enough to give me your opinion about it.

How would a craft perform built by the following dimensions? and in what respect would you advise me to alter the same?

	feet.
Length on load-line	50.00
Breadth at " "	14.06
Depth below load-line keel included (midships) with very hollow bottom	5.00
Displacement in cubic feet	900.00
Area of greatest transverse section in square feet	27.37
Area of load-line	513.66
Centre of gravity below load-line	1.18
Longitudinal centre of gravity at midlength of load line, meta centre—above centre of gravity	7.31
Centre of propulsion above load-line	17.59
Centre of propulsion forward of midlength of load-line	0.06
Area of mainsail	870.00
" " foresail	550.00
" " jib	500.00
" " flying jib	280.00
Whole area of sail	2,200.00

Our correspondent should have given us the depth from load-line to lower side of rabbet, with real name and address; the depth of the keel, which he does not furnish, enters into the problem of lateral resistance; the centre of gravity of each water line, with their breadth and spaces apart, should also have been given, with that of the straight rabbet, area of keel, and centre of gravity of keel, and immersed part of stern-post, in their distended position. Inasmuch as we are called upon to make a proper distribution of the exponentials of a model, and the power to propel that which we have never seen, surely we should be furnished with all the exponents, or with the means of producing them ourselves.—*See Notice to Correspondents.*

INCREASING THE SPEED OF STEAMBOATS.

The London Artizan says, that at a recent meeting of the Royal Society of Arts, Mr. Aytoun stated, that the proposition in hydraulics, that the power required to impel a boat increases as the square of the velocity, has exercised a pernicious influence over the minds of ship-builders, in making them look upon it as hopeless to attempt any increase of speed, which was to be attained by such an enormous increase of power. It, therefore, recurred to him, that by elongating the bow of the vessel, that water which our present steamboats dash aside from their path with great force and velocity, and the rapid removal of which absorbs the whole power of the engine, might be laid aside comparatively slowly and gently, like a sod from a plough, however great the speed of the vessel. He illustrated his idea by various diagrams. The Editor is right—where did he get the idea? Perhaps from the U. S. Nautical Magazine and Naval Journal. Give credit, Gentlemen Eds.

IS THE U. S. S. MERRIMAC A FAILURE?

MESSRS. EDITORS:—Under the above caption you published, in your August number, an article taking strong ground on the negative side of the question; and by a singular coincidence, the same issue contains two other articles, directly or indirectly adverse to the reputation of the Merrimac.

Although, neither your remarks nor any that I could offer, would affect the facts of the case, they may affect the opinions of your readers; and, as an American, I am unwilling to permit a false impression of the qualities and performance of our national steamers to go forth without notice.

I ask, therefore, for a place in your columns in an attempt to show that the Merrimac, and the other four ships built in our Navy-yards, which must, in a measure, share her success, are not such failures as you would have us believe them to be: premising only, that being like yourselves disconnected with the service, and devoid of personal interest in the constructors or construction of the Merrimac, I am actuated simply by a love of fair play.

A careful perusal of your article leads me to divide your objections into several classes, viz: her projecting counter and rudder post, and her great draught of water, both of which, you argue, are defects in a war-steamer. Secondly, her weak (?) rudder post, which you pronounce inadequate to its work; and finally, the use of brass boxes or journals for the propeller. You will, perhaps, allow me to add to the list of these objections, the one made by your *correspondent,* that "the boilers are built in utter defiance of true theory, so much so, that it will not be possible to get from them satisfactory results, as they must be deficient in generating capacity, and require constant repairs," &c. Nobody has yet pronounced her engines failures; and so far as I am aware, her armament and rigging are as yet unscathed by "public opinion." The above, then, appears to be a complete catalogue of the defects which, in your judgment, make this ship a "failure."

I do not, sir, believe the Merrimac and her consorts perfect ships of war; but until something is turned out which, carrying the same weight of metal, stores, and number of day's fuel, shall be as strong, as fast, and as efficient in fighting, I shall indulge the opinion that the vessels in question are not failures; but, on the contrary, are not surpassed by *any* vessels afloat, including the one which is now fitting out at the Brooklyn Navy-yard. And in support of this assertion, let us examine your objections seriatim. First, as regards the overhanging counter and rudder post which you consider weak points of attack for an enemy. It is a well known and ancient adage, that one cannot "eat a cake, and have it," or to apply the maxim here, that we cannot possess two advantages which are incompatible. Now, as an engineer, I allege that if a propeller is to be hoisted out, no other plan as good as the one adopted by government for these steamers, has yet been devised: that, therefore, an extra rudder post is absolutely requisite; and that such

rudder post must extend up to the stern or counter, which necessarily causes a portion of it to be exposed above water. Further, that for a war vessel, it is of great consequence that the propeller should be made to hoist, because for a large proportion of her time she is not under steam; and when under sail, it is contrary to common sense (which you constantly invoke) to have a large and weighty propeller dragging along, whether revolving or otherwise, absorbing a part of the power, and therefore detrimental to speed, besides the injury to which the after part of the ship is liable from the concussions of the sea upon the propeller. That it would require a very expert marksman, a very favorable train of circumstances, and *very* good guns to hit a post, only three or four feet of which is visible above water, and which is continually in motion; that even if hit, it would require an extraordinary shot to carry away such a post, thirty inches wide, fore and aft, by sixteen inches through, and protected by heavy and tough brass knees, extending up around the counter and down the sides of the post to the water line.—Finally, that if any such defect, as you imagine, does exist in the Merrimac, and her consorts, it is shared by every vessel of the British Navy of new and improved construction, not adopted without the concurrence and advice of men who are far better able to judge of the requirements of the case than we are, and who must be satisfied that the advantages of the arrangement far outweigh the disadvantage of a very improbable risk. You are mistaken in supposing that the counters of those vessels are so weak; and I cannot but think that before pronouncing such an opinion, you have failed to make a candid examination. On the contrary, the timber work composing the propeller walls is of the strongest description, and would seem to ensure the safety of the propeller when hoisted up, beyond the possibility of damage by shot.

As regards the draught of water, which is about 23 feet loaded, it should be remembered that these ships have rather more in them, when fully fitted for a cruise, than some " marine architects " are aware of;—that, in addition to all the ordinary requisites for a long cruise, war vessels have to carry spare articles of spars, rigging, machinery, &c., to render them, in case of disaster, independent of foreign countries. Finally, that in vessels intended for fighting ships, a certain solidity is required in the construction, which, of itself, involves weight, and therefore draught of water. It will not do to bring to the solution of this question only the knowledge, theoretical or practical, acquired in the construction of merchant ships. Taking into account these circumstances, and comparing our vessels with the best belonging to foreign countries, we need not fear any comparison with them; and as to the question of marine versus naval architects, let us at least wait until the *six ships* are in commission, so that we may compare the weights on board each, with their relative efficiency as war steamers.

You make a strong point out of the dimensions of the stern-post, which, you allege, are not proportioned to their work. It appears to me, that the

facts do not warrant such an allegation. If the stern-post in an ordinary propeller opening, which would be about three feet shorter, is only required to be about twenty-four to twenty-seven inches fore and aft, (and such a dimension would be ample,) it is easy to show that this one is yet stronger, even taking into account its increased length. In the first place, the strain sideways upon the post, is, at the most, but one-half of the side-thrust, caused by the difference between the resistance, to the two blades, of water near the surface, which is partly displaced upwards, and water which is at such distance from the surface, that it can be displaced only in the direction of thrust; and you are mistaken in supposing that a vibration, (which must exist to some extent, whatever may be the dimensions of the post,) to the *after*-journal of the propeller, would occasion vibration in the shaft. The latter is connected with the propeller only by a tongue and groove on the face of the clutch; and this connection permits a certain degree of side-motion to the after-propeller journal, without any strain on the shaft.

With regard to the brass boxes—their use was undoubtedly an error; but the Department was led into it by the reports obtained of the English steamers, which have suffered in the same way as the Merrimac; and in which a substitute of wooden bearings has been found a cure for the evil. Doubtless all the steamers will be fitted with the same material.

One word about the boilers. Although tolerably familiar with the technical terms used in the profession, I cannot understand the following language in the article of your "*correspondent*," and must ask for additional information:—"The grates or furnaces, instead of being placed at the side transverse vertical to the boiler, their proper positions are under the lower ends of the tubes, at the bottom-sides of the boilers." Passing on to the remainder of the article, it appears that the writer objects to the construction of Mr. Martin's boilers, on the ground that the steam formed on the furnaces must pass through the tubes on its ascent, which thereby become overheated, and require repair. Permit me to call "*correspondent's*" attention to the fact, that the steam generated on the *sides* of the furnaces, goes up through the spaces between the tube boxes; and that the tubes are sufficiently large to carry off the steam produced on top of the furnaces, as well as that made in themselves. It is precisely the great advantage claimed for this boiler, that it ensures a rapid circulation of water, and that the tubes are thereby kept free from scale.

Considering that the Susquehanna is furnished with this form of boiler, which has worked exceedingly well, so far as heard from;* andthat the Minnesota, (which is one of the Merrimac's consorts,) on her recent trip to Philadelphia, made, in the same kind of boilers, an abundance of steam; thereby, showing that the tube-surface was efficient, and that there was no deficiency of water in them—I think "*correspondent*" rather hasty in his croaking about the boilers of the new ships.

* As far as Gibraltar.

Messrs. Editors, I have, perhaps, exhausted your patience, and the space you can allow me, in these remarks; but you must allow me a word more. I do not endorse the Merrimac or any of her consorts; they are all, no doubt, susceptible of improvement; may all be, and doubtless are, open to better lines, better ventilation, and many of those modern appliances which modern times place at the disposal of ship-builders. Perhaps their draught of water might have been a little less. But take them all in all, they are NOT failures, as you have alleged. They will be found good and efficient war vessels—good in fighting, and good in running away—which you appear to consider the most important qualification of a war vessel. Under steam, with an equal consumption of fuel, they will not be surpassed in speed by many vessels of their displacement; under sail, they will be as fast as any; and it certainly seems a hard case that, with a navy of steamers, which are acknowledged by other nations to be the best in the world—putting aside its numbers—the only persons who deny to it the same praise, should be found in our own land. The Merrimac has, it is true, met with disaster; but a fair and candid mind distinguishes between the act and the actor—between the accidents due to inherent, or to casual defects.

FAIR PLAY.

THE OTHER SIDE.

"FAIR PLAY" should in future be better posted, before he writes about that which (by his own admission) he knows but little. He was not aware of the fact that we have spent more years in the Navy, employed in the line of our profession, unshackled by fettering prejudices, than the whole time he has spent in the study of engineering; and before committing himself in so important a matter, he might have been fully informed by the Naval Constructor of his own neighborhood. Those persons to whom the writer refers, who know so much better than himself, well knew that we were about right in our *exposé* of the Merrimac, or we should have heard from them. Their patriotism is of the right stamp, but not like that of the writer's, *calculated to expose the just criticisms of "common sense."*

But another lesson should be learned by "Fair Play." He would prove recreant to a priceless inheritance, his birth-place, were he to remain silent—seeing the danger, and knowing a remedy for the entailed evils which have been fast destroying the vitality of our Navy. We, like the writer, were born on the soil on which we write, nor do not regard it as egotistic to say, that we love our country, not less than he does; and although he has classed us (mechanically) with the *Know-Nothings*, it is quite proper for us to say, we have always repudiated the order, (if such it be,) by endeavoring to get

so far above them, as not to fear them at least. How well we have succeeded, "Fair Play" will have an opportunity to judge for himself. One more remark for the benefit of this modest man, and then we shall proceed to confer upon him the honor of a reply, clothed in the plain garb of "common sense," so difficult for the writer to understand. A just criticism is acknowledged to be a positive benefit, not less to the mechanical than to the literary world, and (if it were possible), is even of more benefit to a branch of the public service, than it could be to private enterprise, which has the healthy and purifying influence of competition to make manifest its defects.

The Army and Navy are two branches of the public service, under the immediate control of Hon. Secretaries, who cannot be conversant with the abuses that exist, and which are perpetuated, notwithstanding their best efforts at reform. The Hon. Secretary of the Navy cannot be expected at the same time to be a statesman, nautical architect, mechanic, engineer, and seaman; as a consequence, just criticisms *from a disinterested independent press, upon nautical mechanism, cannot be otherwise than acceptable to the heads of departments*, particularly to the Secretary of the Navy, whose duties are at once so arduous, complex and responsible.

"Fair Play" has befogged himself, by assuming that we had condemned the batteries of the five steamers, or that we had endorsed the Niagara; we have done no such thing. We have only spoken of the models of the five steamers in general terms, and then only in the language of "common sense," which, plain as it is, he has misunderstood. We have endorsed the *shape* of the Niagara as preferable to that of the other five steamers for speed, without reference to size of ship, weight of metal, or number of guns. We have endorsed the launch of the Niagara as most mechanical, compared with the other five steamers. We have endorsed the strength of the Niagara as exhibited, both at the time of, and since the launch, *it not being necessary to keep guns in her hold, as ballast, to keep her in shape.* We have endorsed the workmanship of the Niagara, in preference to that of the other five steamers, and so have our naval constructors. We have said that the "Niagara" was competent to carry all she was designed to carry.

Now, in the the name of "common sense," what has "Fair Play" been "croaking" about. He does not deny our statements—nor can he, well knowing them to be facts. His friend "Fulton," who so grossly erred, (as shown in our last issue), admitted the superiority of the Niagara's model for speed.

We have said nothing of the engines, boilers or propeller, (except the boxes,) not being in possession of all the *facts* for our data. "Correspondent" has anticipated us in reference to the boilers, and as he is of age, he will be permitted to speak for himself, in reply to "Fair Play." We may only remark, that although we are not financially interested in the U. S. Navy, nor are we professedly engineers, yet we are disposed to follow "Fair Play" on

the subject of the efficiency both of the boilers and engines used in the U. S. Navy, quite as far as he would be willing to go. He knows as well as we do, the difference (in part at least,) between supplying the engines of a fast steamer with steam, and those of a dull one, notwithstanding the engines in both vessels, as well as the propellers or side-wheels, may be alike. But the "Merrimac"—her stern, rudder post, brass boxes, etc.—"Fair Play" would have us believe that he has some knowledge of gunnery too, although he admits that it is but little—and that the post and rudder may be hit under a favorable train of circumstances; but tells us that an exposed outer stern post is absolutely necessary, which we deny; and will add, that if he had known as much of the English Navy as he pretends to, he would not have made the assertion. But, aside from this, the security of the outer post at the counter; he tells us that it is protected (from shot we suppose he means) by having tough brass knees extending up around the counters and down the sides of the post to the "water-line." *Here is a whole meal of mirth furnished in a single sentence.* But we will not pause to partake of the repast ourselves, but will hand it over to our readers, to enjoy at their leisure; admonishing them of the additional security for the propeller, in the "strong timber" surrounding the propeller walls. Is it because this is the stern, and most honorable part of the ship, or because of the "tough brass," or of the "strong timber," that shot will respectfully turn aside and allow the post and rudder to go *shot-free?* But next comes an argument in the line of his profession—he tells us that the stern post of an ordinary propeller would be about three feet shorter, and would only require to be about twenty-four to twenty-seven inches fore and aft; and then he tells us that it is easy to *show*, (but he forgets to do it) that this one is yet stronger although longer.

Now, we will show that it is not as strong as an ordinary propeller, notwithstanding the "tough brass knees" and the "strong timber," upon his own assumption that in an ordinary propeller the side thrust at most is but one half, and that there is no vibration of the after post. "Fair Play" tells us that we cannot have the "cake," and eat it, and for his benefit we tell him that he cannot cut the shaft in two, and keep it whole, both at the same time. In an ordinary propeller the shaft is continuous in one length, and the main bearing is in the inner post, while the outer post has only a nominal bearing, and if the inner bearing remained secure, the outer one would have but little to do. Not so with the *Merrimac* and her consorts. The propeller shafts in these vessels is separate from the main ones, being cut off at the inner post; consequently the strain is about equally divided on the two posts; and we submit the question to those who enjoy an ordinary share of "common sense," whether we are not correct. But of the strength of the stern, we have only to say, that its massive proportions is one of the causes of its weakness. The stern is unnecessarily large; the model above water does not tend to add support; the distribution of the ma-

terials tend to the same end. With respect to spars and rigging, if "Fair Play" has been a constant reader of the U. S. Nautical Magazine and Naval Journal, he would have found that they had not remained "unscathed." We think upon one subject as "Fair Play" does, *that it certainly is a "hard case"* that with a Navy of steamers, which are acknowledged by other nations to be the best in the world—putting aside its numbers—the only persons who deny to it the same praise should be found in our own land. Does the writer know whether it is *the ships*, *the officers*, *the armament*, *or the discipline*, that meets with approval abroad?

Here he is off soundings again, and, as in duty bound, we will throw him a line. We know that the term Navy is applied to both merchant as well as naval vessels by foreigners, and it is chiefly merchant vessels referred to, in the laudations of praise of which he speaks. It is indeed a "hard case," that notwithstanding all the money spent, that there should be cause for animadversions from the independent press upon the inefficiency of our Navy. We do know more. We know that the U. S. Navy is the wonder of scientific men; the matter of surprise is, that with all the advantages we possess, in an efficient marine, *that the Navy should be so much behind it;* and still more we know, the English Navy adopt improvements from our merchant service, and our Government crosses the Atlantic to obtain them, after they have received the English stamp. There is nothing connected with a ship, whether sailing or steaming, which may not be done as efficiently in the United States, as in England or France. Europeans know this, and come and obtain our improvements; but our government has yet to learn the *fact*.

But we forbear. The *Merrimac* is still on her trial trip, and her officers whisper it aloud, that she came out of Key West, when towed by the *Susquehanna*, faster than she had ran before, although herself disabled. Has "Fair Play" seen her log?

We have not analyzed the model of the *Merrimac*, because the writer's remarks do not call for argumentative reasoning; he knowing less about Marine Architectural Science than engineering, he could not have followed us understandingly. It may be worthy of remark, that there is an astonishing amount of ignorance prevailing among the people of the United States, relative to the strength and efficiency of the British Navy. It is a spurious and ill-timed patriotism that would lead any man to overrate the Naval force of his country in time of peace; which is of all others the time to point out those defects which experience has proved to be such, and to make such improvements as a progressive age may devise. The time of war is the time for testing them. Now, what is England's experience in testing her Navy during the late Eastern War? *Did not the press all over Continent and Colony teem with what the British Navy "could, but did not do?"* And has England not learned that the most "inefficient" parts of her fleet, are those ships

which carry the greatest number of guns, and that the most serviceable vessels in her Navy, are a few of the last *gunboats* built, carrying the least number of guns? *Small ships and large guns*, if her experience is worth anything, is best. If we are to follow England, let us profit by her example and experience. She is compelled to increase her Navy beyond the number of ships she requires or wants, in order to maintain a show of efficiency, and yet the English people are wise enough to adopt this measure for effect. They show the list of ships in the British Navy, taking it for granted that its strength will be measured by the number of vessels it contains. England cannot countenance any improvement or change in her mode of Naval warfare, well knowing that her boasted supremacy as a belligerent power would be at an end. *That the present mode will be changed is certain, should ever the private armed force of the United States again be called into active service.* Then why adopt the inefficient Navy of England as a model? Why not act more wisely, *as other Nations do,* and take counsel from a more reliable source than the British Admiralty, whose blundering course has been made so abundantly manifest, *by the English people themselves*, during the late war with Russia. But, to be more particular with reference to the Merrimac and her consorts, we may add, for the edification of "Fair Play," that there is not a vessel in the British Navy, of modern construction, and of the same class, whose model exhibits a wider departure from first principles than does these vessels, as we shall show when necessary, however "hard the case may be."

TO THE EDITORS OF THE NAUTICAL MAGAZINE AND NAVAL JOURNAL.

In reply to your correspondent "Fair Play," I would say that the rectangular-formed boiler, like those in use on the *Merrimac*, has six sides, not enumerating the inside, to wit: a topside, a bottomside, together with four vertical sides, made up of two vertical longitudinal sides and two vertical transverse sides: hence the terms used "at *the side transverse vertical to the boiler*," meaning of course that the side referred to was not the topside, nor was it either one of the longitudinal sides; that in fact the side referred to was one of the two vertical transverse sides named.

Hoping that this explanation will satisfy the hairsplitting propensities of "Fair Play," we will now proceed in due course.

I must now in my turn be allowed to criticise a little, for your correspondent's first remarks are of such a nature as to be incomprehensible.

"Fair Play" surely does not mean to say that I used any such language as the above, quoted in his remarks as coming from me, in which he says, that in consequence of the steam surcharging from the cause set forth, *the steam*

will overheat and require repairs! We think he means that *the tubes* will overheat from the cause named, and so require repairs; this being the statement of my first communication. Also, as regards the statement of "Fair Play," that the steam made on the sides of the furnaces will rise in the water-ways.

In this he also is in error; for, as the steam ascends, it will meet the strong down current descending in the water-ways to the bottom tube sheet, where it curves underneath to keep up the circulation, which it does by constantly supplying water to the lower ends of the tubes, to make good the volume flowing upwards in the tubes. This current then will deflect the steam before named, so as to make it follow the water into the lower ends of the tubes and up the same. Nor is there room in the tubes, as claimed for the steam made on the crown of the furnace, as will be seen from the following simple reasoning, independent of a multitude of facts corroborative of the reasoning referred to.

For example—Mr. Martin claims in his specification, that by removing the furnace from the vertical side of the boiler, and transferring it to the bottom side, or under the lower ends of the tubes, that in so doing he removes the tubes from the direct action of the heat. Now it must be seen *that the contrary is the case;* as any one of capacity in this branch of engineering will not fail to see, that the *proper place* for the furnace *is at the side named*, for several reasons: first, between the crown of the furnace and the upper shell of the boiler, is naught but an open space, known as the steamroom; hence, then, it is evident that the steam must *rise direct* into the space described, thus avoiding the *dangerous passage* through the tubes, as is shown in my first communication, a reference to which will show the facts to be the case, as so far from diminishing the amount of heat acting on the tubes, *it must be increased even in a double ratio* from the causes first described.

And further: it will appear singular to all who think of such matters, that while eminent English engineers are racking their brains to find out some way to reduce the height of their boilers, so as to get them out of the reach of shot and shell, even to the cutting off a large part of the steamroom, and putting the same alongside of the boiler to avoid the danger, now, on the contrary, Mr. Martin puts on the full complement of steamroom a-top in the old way; *and not to do things by halves, he claps a steam-chimney* of considerable height *a-top of all*, as if a steeple was wanted to crown the structure. Nor does he stop here—for as if this absurd arrangement was not sufficient, he now erects the boilers, already enormously too high, *upon stilts*, in order that he may cut off the furnaces from their proper places, as shown, and put them underneath the boiler, thereby elevating the boilers some *six or seven feet* higher than is necessary. Now, in the name of wonder, what is the purpose of all this? Is it that the enemy may readily, by the aid of the smoke stacks, know where to aim at long or short range their shell guns at these

steeples of boilers, in order to explode them, and send our gallant sailors to old Davy, without being able to fire the first broadside at the enemy in return; or is it to promote some private end?

So far as the experiments of these boilers on board the U. S. steamer, the Susquehanna, go, made by Mr. J. V. Merrick, and recorded in the Journal of the Franklin Institute for May, also in the July number of the London Artizan, I have but to remark that they were not of a practical nature. As for example: a ship at sea runs with her dampers wide open, and must urge her fires to the utmost, so as to get a sufficiency of steam. This is the only way to test the boilers practically, running with *salt water* at sea, where the fires are made to burn with a rapid combustion. What kind of an experiment is this for a sea-going war steamer? First, a *building engineer*, who has been employed to build the engines as well as boilers, is selected to make a set of experiments on the boilers, said to have been invented by his employer, the Engineer-in-Chief of the Navy. Woe betide him, if the experiment be not favorable to the man who controls the government patronage. Now, to insure the greatest volume of success, what does he do to prove the value of his employer's alleged invention? Does he get the ship to sea? Does he put her under full steam to urge her to the full capacity of her power? No, he does nothing of the sort; but, on the contrary, he ties her fast to the dock, shuts down the damper, so as to burn the coal in the slowest manner, in order to insure the water in the tubes remaining solid and of a low temperature, because this modus will ensure the best result; and to help all this, the fresh water of the Delaware is used instead of salt, it being a well-known fact, that it requires a much larger amount of caloric to vaporize salt than fresh water. But why pursue this humbug further? Any one must see the nature of this dangerous abortion.

CORRESPONDENT.

THE 28TH ANNUAL FAIR OF THE AMERICAN INSTITUTE.

THE 28th Annual Fair of the Institute will be held at the Crystal Palace, in the city of New-York, and will be opened for the reception of visitors on the 22d of September, 1856, closing on the 25th of the following month.

The managers have made extensive preparations for a creditable exhibition.

From the disposition evinced by the Institute to correct any errors which may have occurred heretofore, in the proper adjustment of awards, it is believed that practical and disinterested judges will be appointed to examine and report upon the articles on exhibition; and the managers pledge themselves to see that justice is done to every exhibitor. The gold medals are to be increased to double the former size; the silver medal also is to be greatly enlarged.

A better distribution of space is also to be made, with ample steam power,

for operating all machinery entered for competition. We anticipate an improvement upon all former exhibitions. Wm. B. Leonard, Esq., is corresponding Secretary, 351 Broadway.

ABSTRACT OF TONNAGE, 2d QUARTER, 1856.

	United States.				Foreign.			
	Vessels.	Tons.	Qrs.	Men.	Vessels.	Tons.	Qrs.	Men.
Arrivals	865	412,559	1	13,272	393	125,205	2	4,948
Clearances	658	353,208	3	11,261	340	115,388	–	4,621
				Coasting Vessels.				
	Licensed.				*Registers.*			
Arrivals	191	80,646	–	——	333	74,408	–	——
Clearances	366	132,951	–	——	972	263,793	–	——

THE JAPAN EXPEDITION.

The long-expected book of Commodore Perry, the publication of which was authorized by Congress a year ago, and the expenses of which, are paid from the National Treasury, has issued from the press in handsome quarto volumes, full of interesting illustrations of the manners and customs of the foreigners whom he met, and the most beautiful scenes of the far-off countries which he visited.

Messrs. Appleton & Co. have also issued an octavo edition, upon a smaller and more compact scale, with a copy of which we have been favored by the publishers.

It is only necessary to state, that the mass of materials collected by the talent and industry of the Commodore and officers, were very wisely placed in the hands of Dr. Hawks of this city, who has, under the Commodore's constant supervision, compiled one of the most readable books of the times; and it is undoubtedly the best historical authority extant, upon the subject of Japan and the Japanese.

By those who have read Bayard Taylor's last and most interesting volumes, and the graphic sketches of Japan, Loo Choo, &c., which have lately appeared in Harper's New Monthly—both prepared from the materials afforded by this cruise—the Commodore's work will be considered not so remarkable for its novelty as for its naval and diplomatic narrative, and the beauty of its racy illustrations.

It is due to sober truth and common justice, that the elements from which all this valuable information is derived, should be understood.

When the expedition was fitted out, Mr. Secretary Graham—following the poor example of Mr. Secretary Paulding, under whom the South Sea Expedition had been fitted out years before—issued the general order that all the officers of the fleet should keep journals, and give them up to the Commodore at the close of the cruise. This order was enforced.

There were from fifty to sixty commissioned officers in the squadron.—Many of them men of education and talents, as well as of professional skill, and their contributions to the Commodore's stock of information, is handsomely acknowledged by him in a note to the introduction, of which the following is a copy:

"The Commodore, unwilling to appropriate what may belong to others, desires here to acknowledge the use of the *Journals* of the Captain of the fleet, Commander Adams; of the Flag-Lieutenants, Mr. Contee and Mr. Kent; those of Purser Harris, Mr. Perry, (Commodore's Secretary,) Mr. Bayard Taylor and Chaplain Jones; the *Reports* of Captains Abbot, Buchanan and Adams, Commandants Boyle, Kelly and Glasson, Chaplain Jones, Mr. Williams, Chinese interpreter, and Doctors Green and Fahs; the *services* of Mr. Portman, Dutch interpreter, and of the artists, Mr. W. Heine and Mr. E. Brown, jr. In the hydrographical department, he would specially acknowledge the accurate and laborious work of Lieutenants W. L. Maury and S. Bent. Nor would he pass by without notice, minor contributions from any under his command; to all he would render due credit and thanks."

In our judgment, the officers might have refused to surrender their valuable journals, even under the order of the Secretary of the Navy. For what right had the Department to require journals at their hands? Certainly, journalism is no part of the Naval profession; and diaries, when kept by officers, are generally manuscripts of mere leisure, for the sake of amusement—never intended for public use or literary criticism. We therefore regard the arbitrary exercise of the Secretary's official authority, as wrenching from the hands of the officers their personal property, in private papers, which should ever be held as inviolable. Nor do we believe any President of the United States would approve the decision of a court which should convict of wilful disobedience of orders, the officer who should positively refuse to surrender his private journal to his Commander, even though the order should emanate from the Secretary himself.

If for their journals the officers should be voted a reasonable number of the Congressional copies of the work, to the compilation of which those journals may have contributed—if the same kind of remuneration should be made them, that is made the Commodore, however small the proportion—if they could share in the services of plate and gold medals awarded to their Commodore, by foreign and home Chambers of Commerce and Boards of Trade, and other incidental privileges and popular honors, these journals might with propriety, be demanded, and no doubt would, in all such expeditions, be carefully kept and cheerfully given up. But no such award is vouchsafed to any officer of the fleet; even though his rank upon the Navy list may be the same as that of the temporary Commodore—not even a single copy of the book itself is given to either of them by the government.

But Commodore Perry is entitled to much credit for his frequent acknowl-

edgments of their literary and scientific aid; and his work, unlike the report of the South Sea Expedition, is presented to the world comparatively devoid of egotism and self-sufficiency, and if there were any obstacles incidental to controlling other men's wills in accomplishing all that he would, Commodore Perry has happily forgotten them; and in a style the most acceptable, this novel history is presented without censure.

The talented editor and skillful artists have recorded and illustrated the becoming conduct of the officers and men of the expedition in the most complimentary manner.

We do not look to the treaty with Japan as being of so much commercial importance as has been supposed and represented. Much is accomplished for the world, by opening that sealed empire, even though merchants should not immediately profit largely from the event. Other nations have hurried in to claim from Japan all the advantages which were secured by our expedition, and we are happy to see the advantages have been granted. But it will be years—perhaps centuries, as in China—before we shall derive considerable profits from any trade that may grow up with Japan. That people have forever been accustomed to want nothing which they do not produce themselves—and we must teach them to want before we can sell them our productions, either of manufactures or agriculture. Yet the treaty of Kenegawa gives us navigational rights and privileges which cannot be too highly valued; and we are of those who are amongst the most thankful to Commodore Perry for his services.

One of the Journals not handed to the Commodore.

Journal of the Cruise of the U. S. S. Saratoga to the East Indies, China and Japan, during the years 1850–1, 2, 3 *and* 4.

By John Bennett, Boy.

The U. S. ship Saratoga was put in commission at Norfolk, Virginia, on the 12th day of August, 1850, William S. Walker, Esq., Commander, destined for the East Indies.

September the 15th, she dropped down to Hampton Roads, and on the 18th sailed for Rio Janeiro.

Crossed the equator October 30th, in twenty-five degrees, twenty-seven minutes west longitude. When crossing, Neptune paid the ship a visit, and the ceremony of shaving the green ones was gone through with.

November the 9th, came to anchor in the harbor of Rio. Saluted the Brazilian flag with 21 guns. Salute returned by the fort. Logged, 7,228 miles; time, 52 days.

November the 21st, sailed from Rio.

On the 27th, obtained soundings in the Atlantic Ocean, at the depth of three thousand one hundred fathoms, or three miles and a half.

December 14th, spoke the English ship Albemarle, forty days out, bound to Shanghae.

December 17th, came to anchor in Soldanna Bay, in the southern part of Africa. Logged, 3,605 miles; time, 28 days.

Sailed, December 21st. Arrived at Cape Town on the 22d. Logged, 156 miles.

On the 23d, saluted the English flag with 21 guns; returned by the fort.

January the 3d, 1851. Got under weigh and beat out of Table Bay.

January the 17th. Caught an albatross, measuring ten feet nine inches across the wings.

January the 30th. Hove-to off the islands of Amsterdam and St. Paul's. Exchanged some tobacco for fish with a fisherman from the Isle of France.

February 14th. William B. McKay, marine, died.

February 22d. Spliced the main brace in honor of the day.

February 23d. Boarded the American whale ship Washington, of New Bedford; four months out on a cruise.

March 7th. Arrived at Catelli on the island of Bouro, in the sea of Celebes.

On the 8th, the Governor visited the ship. Saluted him with nine guns.

March the 11th. Exchanged salutes with the fort. Bouro is subject to Holland. The inhabitants are Malays. Logged, 7,596 miles; time, 62 days.

Sailed from Bouro, March 12th.

March 25th. Hove-to off the Pelew Islands. Great number of natives came off in canoes for the purpose of trading.

April 7th. Arrived at Macao. Logged, 2,666 miles; time, 26 days.

April 8th. Saluted the Portuguese flag with 21 guns.

April 18th. Warped into Typa Bay to fit ship.

May 6th. A regatta of two American and six English yachts was held in view of the ship. Won by the American yacht, Raven. Came out of the Typa on the 15th of May, and anchored in Macao Roads.

May 21st. Sailed, with the American Consul as passenger. Arrived at Hong Kong on the 22d. Logged, 45 miles. Saluted the English flag with 21 guns.

May 23d. John Pringle, seaman, died.

May 24th. Dressed the ship with the different national flags, and fired a salute of 21 guns, in commemoration of the birth of Victoria of England.

May 30th. The officers gave a grand ball on board the ship to the English Army and Navy officers stationed at Hong Kong.

Sailed, June 7th. Arrived at Macao on the 8th. Logged, 45 miles.

July 4th. Hoisted the American colors at each mast-head, read the Declaration of Independence, spliced the main brace, and fired a salute of 21 guns in honor of the day.

Sailed, July 19th. Arrived at Bocca Tigris on the 20th. Logged, 50 miles.

August 6th. Mr. Forbes, the American Consul at Canton, visited the ship. Saluted him with 9 guns.

Sailed, Aug. 7th. Arrived at Cumsing Moon on the 8th. Logged, 45 miles.

Sailed, October 16th. Arrived at Whampoa on the 19th.

October 24th. Doctor Parker, the American Charge d'Affaires at Canton, visited the ship. Saluted him with 13 guns.

Sailed, October 28th. Arrived at Macao on the 29th. Logged, 56 miles.

November 27th. David Stuart, seaman, died.

December 5th, Sailed. Arrived at Whampoa on the 8th. Logged, 80 miles.

Sailed, Dec. 15th. Arrived at Macao on the 19th. Logged, 80 miles.

December 16th. Richard Fletcher, boy, died.

December 27th. Got under weigh in company with the Portuguese corvette Don Joao the 2d, and the French frigate Algeria, bound to Manilla. Arrived at Manilla January the 1st, 1852; (the Algeria arrived the day previous.) Saluted the Spanish flag with 21 guns. Logged, 613 miles.

January 2d. The American Consul visited the ship. Saluted him with 9 guns.

January 30th. Dressed the ship with the different national flags, and fired a salute of 21 guns in honor of the birth of the Duchess of Montpensier.

Sailed, February 1st. Arrived at Hong Kong on the 8th. Logged, 823 miles.

February 4th. The U. S. steamer Susquehanna, Commodore John Aulick, arrived on the station.

February 11th. Commodore Aulick visited the Saratoga. Saluted him with 15 guns.

February 18th. Her Britannic Majesty's ship Hastings, 74, Admiral Austin, sailed for England. Manned the rigging and gave her three cheers.

February 22d. Spliced the main brace, and fired a salute of 21 guns in honor of the birth of Washington.

February 25th. The U. S. sloop Marion sailed for the United States. Manned the rigging, and gave her three cheers.

Sailed, March 20th. Arrived at Macao in five hours. Logged, 45 miles.

Sailed, March 25th. Arrived at Hong Kong on 26th. Logged, 50 miles.

April 3d. The U. S. ship Plymouth, Commander Kelly, arrived on the station.

April 10th. Exchanged salutes with the English frigate Cleopatra.

Sailed, April 24th. Arrived at Macao same day. Logged, 45 miles.

April 30th. Hoisted the Portuguese colors at the fore, and fired a salute of 21 guns in honor of the adoption of the Portuguese Constitution.

Sailed, May 3d. Arrived at Amoy on the 13th. Logged, 511 miles.

May 16th. Received from Her Britannic Majesty's brig Lily 21 coolies, as prisoners.

Sailed, May 19th. Arrived at the island of Ti Pan San on the 22d. Logged, 326 miles. The reason for visiting this island was as follows:—Some time in the early part of March, 1852, the ship Robert Bowen, of New-York, sailed from Amoy for California, with 400 Chinese coolies as passengers. Her crew consisted of 19 men. When a few days out, the coolies, from some cause, rose and murdered the captain, mate, and five seamen. Shortly after, the Bowen made the island of Ti Pan San; here most of the coolies went on shore. The rest of the crew, taking advantage of this circumstance, succeeded in mastering the coolies left on board, slipped the cables, put to sea, and arrived at Amoy in safety. Her Britannic Majesty's brig Lily, then lying at Amoy, hearing of the circumstance, proceeded immediately to Ti Pan San and succeeded in capturing 22 of the coolies and killed 10 others.

On the night after the arrival of the Saratoga a party of 134 seamen and marines was landed, in three divisions, commanded by Lieutenants Wayne, Howel, and Lowry, the whole being under the command of Lieutenant J. R. Goldsborough. During the night and next day succeeded in capturing

70 of the coolies. Some few of them were killed; the rest fled to the mountains. The expedition met with no accident whatever.

May 25th. Rode out a very heavy gale of wind with three anchors ahead.

May 28th. A second expedition was sent on shore, but met with no success.

Sailed, May 30th. Arrived at Hong Kong on the 7th of June. Logged, 869 miles.

June 4th. On the passage to Hong Kong the ship was struck aback in a heavy squall, and came near being lost.

Sailed, June 21st, for Amoy, with 60 of the coolies on board, they having been discharged, there being no evidence against them. The ringleaders had been picked out and delivered over to the Chinese authorities at Canton. Arrived at Amoy on the 23d of June. Logged, 510 miles.

After sending the coolies on shore, sailed again June 25th; but, in beating out of the harbor of Amoy, the Chinese pilot ran the ship upon a reef of rocks called Manner's Reef. Her Britannic Majesty's steamer Semiramis immediately came to our assistance. After lightening the ship by throwing overboard her starboard battery and getting the shot out of her, succeeded in getting her off, without sustaining any material damage except the loss of two guns.

Sailed, June 28th. Arrived at Hong Kong July the 4th. Logged, 485 miles.

On the same day dressed the ship with the different national flags, spliced the main brace, and fired a salute of 21 guns in honor of the day.

Sailed, July 13th. Arrived at Whampoa on the 16th. Logged, 87 miles.

August 3d. William Nugent, ordinary seaman, died.

August 5th. Timothy H. Walker, master-at-arms, died.

Sailed, August 10th. Arrived at Cumsing Moon on the 11th. Logged, 79 miles.

August 30th. Thomas H. Dennison, ship's steward, died.

September 4th. Owen Hughes, marine, died.

Sailed, September 9th. Arrived at Hong Kong on the 10th. Logged, 45 miles.

September 16th. Sailed on a cruise. Ran into St. John's on the 22d and fished the fore yard, it being rotten.

Sailed again on the 25th. Arrived at Macao, September 28th. Logged, 832 miles.

Sailed, September 29th. Arrived at Cumsing Moon the same day. Logged, 26 miles.

After procuring a new fore yard from the steamer Susquehanna, sailed again October 2d, to finish the cruise.

On the 4th, passed the Typee Islands.

On the 5th, made the Island of Hainan the cruising ground.

On the 9th, encountered a most violent typhoon off the Gulf of Tonquin. The following account of it is from the ship's log: On Saturday, October 9th, 1852, in latitude 17 degrees 35 minutes north, 110 deg. east longitude. From meridian to 3 o'clock, P. M., wind fresh from N. N. W.; atmosphere cloudy; weather pleasant; barometer 30; thermometer 80 deg.; water 75 deg. At 1 o'clock, 30 minutes, called all hands; sent down top-gallant-yards and top-gallant-masts; furled the main-sail; reefed the fore-sail; close reefed and furled the fore and mizzen-top-sails, and treble reefed the main-top-sail; secured the guns with a hawser, and made every preparation

for a heavy gale of wind. At 3 o'clock, P. M., barometer 29.90; wind N. W. and freshening; squalls increasing in force and number, with heavy rain; barometer oscillating very much, with a downward tendency, and every appearance of a typhoon; furled the fore-sail; bent and set the fore-storm-stay-sail; a very ugly appearance at E. N. E.; close reefed the main-top-sail. At 4 o'clock, barometer 29.18; wind north-west, and sea increasing; clewed up the main-top-sail; brailed up the main-try-sail, and kept away to the south. At 8 o'clock, wind N. W. and blowing a complete hurricane; being unable to secure the main-top-sail or main-try-sail had to let them blow away. At 8 o'clock 30 minutes, barometer 29.16; wind north-west, blowing a cyclone; tremendous sea running, and increasing; water highly phosphorent; particles of luminous water, one-eighth inch in diameter, flying about; spoon-drift-like torrents of rain. At 9 o'clock, barometer 29.24; wind north-west by west; the fore-storm-stay-sail, main-top-sail (partly furled) blew away; attempted to wear ship, but a portion of the main-try-sail having blown into the lee-main-rigging the ship would not go off. The force of the wind at this time was terrific, the ship was pressed bodily down in the water, and at one time the sea was waist deep on the spar deck; her guns were frequently entirely under water; very little water came to windward, but poured in over the lee netting in a perfect cataract. About 9 o'clock 30 minutes, the port quarter-boat is supposed to have been blown or washed away; by this time had succeeded in getting rid of a portion of the main try-sail; manned the weather fore-rigging, and wore ship to the northward and westward; the foot of the spanker got adrift and flapped to pieces before it could be secured. At 10 o'clock, barometer 29.42; wind west-south-west, and hauling gradually to the southward. At 11 o'clock, barometer 29.70; wind south-west; discovered that both stern boats were gone, also, a spare fore-top-sail-yard from the port chains. At 11 o'clock 30 minutes, wind moderating, but blowing heavily in squalls. 12 o'clock, midnight, blowing a strong gale; wind S. by W.; barometer 29.90.

[NOTE.—The most remarkable circumstances in relation to this typhoon was the oscillating of the barometer between 29.90 and 29.76. Although frequently examined, no correct notice was taken. It vibrated between those ranges from 3 o'clock, P. M., until 6 o'clock, P. M. After 6 o'clock, P. M., the barometer began to fall, and fell rapidly, without ceasing, until 8 o'clock, P. M., when it appeared to hang at its lowest range, 29.13. For half an hour, at 8 o'clock 30 minutes, the barometer began to rise, and 29.16 is the first note made of it immediately afterwards. At 9 o'clock, P. M., the barometer was up to 29.24; it now began to rise as rapidly as it had fallen, and continued to rise, without cessation, until it reached its mean height. The wind hung at N. W. from meridian until 9 o'clock, P. M.; it then commenced hauling to the southward, and continued to haul gradually until it had got as far as S. W. by S.: at that point it remained for several hours, and then began to work by degrees until it had reached its regular course in the N. E. monsoon. When the typhoon first commenced, we supposed ourselves on the south-western side of the centre of the circle, but its western course placed us on the S. E. of the centre; therefore, a south course would have run us out of the force of the typhoon.]

Oct. 14th and 15th. Had a gale of wind from the N. W.

Oct. 19th. James Carson, ordinary seaman, died.

Oct. 25th. Picked up a dismasted Chinese junk, in distress. Her crew

had consisted of 12 persons, 6 of whom had been washed overboard and lost. They had been blown off from Shanghae in a typhoon, fifteen days previous. They had neither provisions or water. After taking them on board set fire to the junk. Arrived at Macao, Oct. 31st. Logged, 3,159 miles.

Nov. 1st. The rescued Chinese were sent ashore in Macao, and presented with fifty dollars, collected by the ship's company.

Nov. 4th. William Murphy, seaman, died.

Sailed, Nov. 13th. Arrived at Hong Kong on the 14th. Logged, 45 miles.

Nov. 29th. The officers gave a grand ball on board the ship to the Governor and citizens of Hong Kong.

Dec. 12th. John A. Chase, seaman, was drowned.

Jan. 17th, 1853. The Hon. Humphrey Marshall, Minister to China, visited the ship. Saluted him with 17 guns.

Sailed, Jan. 21st. Arrived at Macao same day. Logged, 47 miles.

Sailed on the 28th Jan. with the Minister on board. Arrived at Whampoa on the 31st. Logged, 80 miles. Mr. Marshall left the ship same day for Canton. Upon his leaving, saluted him with 17 guns. The French frigat Capricieuse also fired a salute of 17 guns.

Feb. 3d. Thomas Johnson, marine, died.

Sailed, Feb. 4th. Arrived at Hong Kong on the 5th. Logged, 67 miles.

Feb. 22d. Hoisted the American colors at each mast-head, spliced the main brace, and fired a salute of 21 guns in honor of the birth of Washington. The English frigate Cleopatra also fired a salute of 21 guns in honor of the day.

March 8th. The English frigate Spartan arrived at Hong Kong from Singapore.

March 10th. The Cleopatra sailed for England. Manned the rigging, and gave her three cheers.

Sailed, March 15th. Arrived at Macao same day. Logged, 45 miles.

Sailed, March 31st. Arrived at Hong Kong same day. Logged, 45 miles.

April 7th. The U. S. steamer Mississippi, Commodore M. C. Perry, flagship of the Japan squadron, arrived at Hong Kong.

Sailed, April 16th. Arrived at Whampoa on the 19th. Logged, 80 miles.

Sailed, April 22d. Arrived at Macao on the 25th. Logged, 80 miles.

April 29th. Hoisted the Portuguese colors at the fore, and fired a salute of 21 guns in honor of the Queen of Portugal's birth.

May 5th. Joseph Lytle, captain's cook, died.

May 11th. James Welch, seaman, died.

Sailed, May 11th, for the Loo Choo Islands. Arrived at Napa Kiang, and came to anchor in Kiang Roads on the 26th. Logged, 1,462 miles. The steamers Susquehanna and Mississippi arrived the same day from Shanghae. The store-ship Supply arrived on the 29th of May.

May 28th. Shang Ta Moth, Prince Regent of the kingdom of Loo Choo, visited Commodore Perry on board his flag-ship, the Susquehanna.

June 6th. Commodore Perry and suite, escorted by 200 seamen and marines, paid the Prince Regent a visit at his capitol. The Commodore was courteously received by the Prince. Several handsome presents were made by the Commodore.

Loo Choo is tributary to Japan.

Sailed, June 9th, in tow of the Susquehanna, for the Bonin Islands. On

the 13th, passed the island of Rosana. On the 14th, arrived at Port Loyd, on Peel Island, one of the Bonin group. Logged, 829 miles; time, 106 hours. There were twenty-one persons living upon the islands at the time of our visit.

Sailed, June 18th, in tow of the Susquehanna. Arrived at Napa Kiang on the 23d. Logged, 876 miles.

June 28th. The American schooner Brenda arrived at Napa from Shanghae.

Sailed, July 2d, in company with the squadron, for Japan, in tow of the Susquehanna; the Plymouth in tow of the Mississippi.

July 4th. The squadron fired a national salute of 21 guns in honor of the day.

July 8th. Made the island of Niphon, and came to anchor off Fort Point, in the Bay of Jeddo. Got springs on the cables and cleared the ship for action. Large numbers of natives came off in boats, but were not allowed to come on board the ship.

July 14th. Commodore Perry and suite, escorted by 300 seamen and marines, landed, for the purpose of presenting a letter from the President of the United States to the Emperor of Japan. Several valuable presents were made to the Emperor. The Japanese showed quite a friendly disposition towards our people. Got under weigh same day and stood farther up the bay. Came to anchor within 15 miles of the city of Jeddo.

July 16th. Got under weigh in company with the Plymouth, and beat down to Susquehanna Bay. Came to anchor off Perry Island.

July 17th. Sailed, in tow of the Susquehanna; the Plymouth in tow of the Mississippi. Passed a large volcanic island same day.

July 20th. Cast off the hawser and parted company with the squadron, shaping our course for Shanghae, the steamer having towed us 437 miles.

July 21st. A gale of wind came on, which lasted six days.

July 22d. Passed through the Cecille Archipelago, between Royalist and Pennell Islands.

July 26th. Came to anchor under the lee of Saddle Island.

On the 27th, spoke the clipper ship Ariel, of New-York, from Hong Kong for Shanghae.

July 28th. Got under weigh. Arrived at Gutzlaff on the 30th. The American ship Gentoo arrived at Gutzlaff on the 29th, 160 days from Boston. During the month of July the U. S. steamer Powhattan, Captain McCluney, corvette Macedonian, Commander Abbot, and the sloop Vandalia, Commander Pope, arrived at Hong Kong, to be attached to the Japan squadron.

Aug. 2d. Got under weigh and stood up the Yang Tze Kiang River, and came to anchor off Woosung.

Got under weigh on the 3d, and arrived at Shanghae Aug. 4th. Logged, from Jeddo Bay to Shanghae, 1,407 miles.

Aug. 5th. Mr. Cunningham, the American Consul at Shanghae, visited the ship. Saluted him with 9 guns.

Aug. 8th. The American clipper ship Nightingale sailed for London against the English clipper ship Challenger, for a bet of $5,000. The Challenger sailed on the 5th.

Aug. 21st. After transferring the battery and stores to the ship Living Age and brig Snipe, put the ship into the dry dock for repairs.

Sept. 2d. Richard Holgate, marine, died.

Sept. 5th. John Smith, 2d captain of main hold, died. Same day, the ship came out of the dry dock.

Sept. 8th. The rebel army took possession of Shanghae. The Imperialists made but a trifling resistance.

Sept. 19th. The Hon. Humphrey Marshall visited the ship. Saluted him with 17 guns.

Ten or twelve American clipper ships have left this port for London during the past month.

Nov. 2d. The Hon. Humphrey Marshall visited the ship previous to taking his departure for the United States. He left the same day for Hong Kong, in the steamer Lady Mary Wood. Saluted him with 17 guns.

Nov. 10th. The French war steamer Colbert arrived at this port from Hong Kong, with the French Minister to China on board.

Nov. 10th. The Imperialist fleet, consisting of 14 war junks and 6 square-rigged vessels, commanded by Sam Qua. The Chinese Taoutae, or Governor, stood up the Yang Tze Kiang River and commenced an attack upon the city of Shanghae; also upon the rebel fleet, consisting of two square-rigged vessels and three lorchas, lying before the city. After a short combat, the rebel vessels were captured, and their crews immediately decapitated and thrown overboard. The Imperialists then landed in the southern suburb of the city (outside the city walls), and after obtaining an immense amount of valuable plunder, set fire to the suburb and destroyed 1,500 houses. The rebels still kept up a constant fire upon the Imperial fleet, from two small batteries near the city walls, and finally drove them off. The Imperialists lost above 300 men in the engagement; several of their vessels were much cut up, and two of them sunk.

Nov. 29th. The Russian frigate Menzikoff and steamer Yostock arrived at Shanghae from Nangasaki, Japan.

Nov. 30th. The French steamer Cassini sailed for Nankin, with the French Minister on board.

Dec. 3d. The Russian Admiral, Korsakoff, visited the Saratoga. Saluted him with 15 guns.

Dec. 3d. Joseph Platt, gunner's mate, died.

Dec. 7th. The Imperial fleet, under command of the Taoutae, made an attack upon the city of Shanghae, and set fire to the eastern suburb of the city, destroying upwards of 1,000 houses. After a couple of hours' fighting the rebels drove them off with the loss of two junks blown up. Loss by the fire estimated at $3,000,000.

Dec. 29th. The American ships Channing and Snow Squall sailed for New-York.

1854. During the latter part of December, a conspiracy was discovered among a portion of the rebels in the city of Shanghae, the object of which was to deliver the city up to the Imperialists. The plan was to set fire to the city, and, in the confusion, open the city gates to the Imperialists. Although the conspiracy was well known to (Lew) the rebel chief, no measures were taken to intimate to the conspirators that their designs were suspected, but were left to go on until they commenced setting fire to the city, when fifteen of the ringleaders were immediately seized and thrown into the flames (bound hand and foot), and there suffered a horrible death. On the next morning (Jan. the 1st), seventy-nine others implicated in the conspiracy were beheaded, and their heads stuck on poles upon the city walls, a warning to all traitors.

Jan. 5th. The English war steamer Salamander went to sea.

Jan. 9th. The English ship John Fletcher sailed for London.

Jan. 12th. The French Consul at Shanghae visited the ship. Saluted him with nine guns.

Jan. 13th. The Spanish brigs Aurora and San Benito sailed for Manilla.

Jan. 16th. The American ship Beverly sailed for New-York.

Jan. 18th. The U. S. ship Plymouth arrived, 21 days from Hong Kong. (On the 25th October, the Plymouth encountered a violent typhoon at the Bonin Islands. Lost her second cutter, a lieutenant, and fifteen men.)

Jan. 28th. The English war steamer Rattler arrived from Hong Kong.

Jan. 29th. The English frigate Spartan went to sea.

Jan. 30th. Got under weigh, and was towed down to Woosung by the steamer Confucius.

Feb. 1st. Got under weigh and went to sea, bound to Loo Choo. Arrived at Napa Kiang on the 7th. Logged, 724 miles. Met the steamers Powhattan, Susquehanna, and Mississippi standing out of the harbor, bound to Japan. After exchanging signals with the Commodore, filled away and shaped our course for Jeddo. The Macedonian, Vandalia, Southampton, and Lexington, had sailed eight days previous for Jeddo. The Supply remained at Napa, the Plymouth at Shanghae.

Feb. 13th, Sunday. The body of Henry Crummill, seaman, was committed to the deep.

Feb. 14th. Made the island of Niphon. Observed a large volcano in eruption on the island of Cassini.

Feb. 16th. Was blown off the coast in a heavy gale of wind.

Feb. 17th. The ship was hove down in a terrible squall from S. W., burying her lee hammock rail completely under water.

Feb. 19th. Hove-to in a heavy gale from N. W. Split top-sails and courses, stove half ports, and had both heads washed away.

Feb. 21st. A wild, heavy sea running; much lightning around the horizon.

Feb. 22d. Had some tremendous squalls from N. W., accompanied with rain, hail, and snow. Ship battened down, fore and aft, but behaving finely.

Feb. 28th. Made the island of Oasima for the third time.

March 2d. Came to anchor in 45 fathoms water off Cape Sagama, at the entrance to the Bay of Jeddo.

March 3d. Got under weigh, and commenced beating up the Bay of Jeddo. The wind dying away, was taken in tow by seven Japanese boats. Came to anchor off the town of Ouraga.

March 4th. Got under weigh, and beat up the bay to join the squadron. Ran the ship upon a shoal called the Saratoga Spit. Got her off without sustaining any damage. Came to anchor the same evening, with the rest of the squadron off the town of Kunagawa, nine miles from the city of Jeddo. Logged, from Loo Choo, 2,066 miles.

March 8th. Commodore Perry and suite, escorted by 700 armed seamen and marines, accompanied by three bands of music, landed for the purpose of making a commercial treaty between the United States and the empire of Japan. Upon landing, the American and Japanese flags were each saluted with 21 guns. The Commodore was received with much respect and ceremony by the Japanese.

March 9th. The body of Robert Williams, a marine on board the Mis-

sissippi, was interred at a place called Garahawa, in a piece of ground granted to Commodore Perry the day previous as a burial ground for the Americans. Williams was the only death that had occurred in the squadron since its arrival in Japan.

March 10th. Commenced trading with the Japanese.

March 13th. The presents sent by the U. S. Government to the Emperor of Japan was landed, consisting of a locomotive, a passenger car, materials for a railroad, printing press, telegraph apparatus, all kinds of agricultural implements, cloths, calicoes, rifles, muskets, pistols, field pieces, mortars, life boats, Daguerreotype apparatus, Yankee clocks, liquors of different kinds, and numerous other articles, all of the best and most approved quality.

The empire of Japan comprises five principal and a large number of smaller islands lying between the 130th and 145th parallels of east longitude, and between the 30th and 50th parallels of north latitude, in the Pacific Ocean. There are great mineral riches on the islands: gold, silver, copper, lead, iron, and coal of the best quality. Upon Niphon, the largest of the islands, is an active volcano, called Mount Fusee, 12,000 feet above the level of the sea; it is covered with perpetual snow. The population of the empire is estimated at 35,000,000 of inhabitants. The city of Jeddo is the capitol. There are two Emperors, one spiritual and the other civil; the first is the ruling Emperor. The people are divided into seven classes: princes, nobles, priests, soldiers, merchants, mechanics, and laborers.

March 17th. Commodore Perry had a second interview with the Japanese Commissioners at Yokohama.

March 19th. The store ship Supply arrived, 16 days from Shanghae.

March 20th. The sloop Vandalia and store ship Southampton went to sea.

March 22d. The circular railroad, built at Yokohama by order of Commodore Perry, was finished, and the locomotive commenced running, to the great astonishment of the natives. About a mile of the magnetic telegraph was also put in operation.

March 24th. The Commodore had a third interview with the Japanese Commissioners at Yokohama. A large number of presents intended for the U. S. Government was sent to the Commodore by the Emperor. The Susquehanna sailed same day for Hong Kong.

March 27th. A Japanese Prince, accompanied by the Japanese Commissioners and a number of mandarins, visited Commodore Perry on board his flag-ship, Powhattan, to partake of a dinner prepared for the occasion. The Japanese flag was hoisted at the Powhattan's fore and mizzen, and saluted by the squadron with 17 guns.

March 29th. The Vandalia and Southampton arrived from Simoda.

March 31st. Commodore Perry concluded the Treaty with the Japanese.

April 4th. Got under weigh for home, by the way of the Sandwich Islands and Cape Horn, carrying Capt. H. A. Adams as bearer of dispatches for the Government, and 15 invalids from the squadron. In passing, the squadron was cheered by each of the ships, the bands of the Powhattan and Macedonian playing "Home, Sweet Home." Saluted the Commodore with 13 guns; returned by the Powhattan. Came to anchor the same evening in Susquehanna Bay.

April 5th. Got under weigh and went to sea. Had a gale of wind same day.

April 7th and 8th. Hove-to in a gale from S. W.

April 9th. The body of James Ruth, seaman, was committed to the deep.

April 18th. In latitude 38 degrees north, crossed the meridian line into the western hemisphere. Spliced the main brace upon the occasion.

April 30th. Arrived at the island of Oahu, and came to anchor off the town of Honolulu. Logged, from Jeddo, 4,170 miles. Same day Mr. Angell, the American Consul at Oahu, visited the ship. Saluted him with nine guns.

May 1st. Saluted the Hawaiian flag with 21 guns.

May 6th. Hollis Harrington, ordinary seaman, died.

May 13th. The Russian frigate Diana arrived from Mazatlan.

May 16th. The Hawaiian Prince, Liholiho, and suite, visited the ship. Saluted him with 19 guns. Same day the American bark Waverly sailed for San Francisco. Capt. Adams, the bearer of dispatches from Commodore Perry, went passenger.

May 18th. Sailed for the Society Islands.

May 27th. Crossed the equator in the 133d parallel of west longitude.

June 5th. Made the island of Emeio.

June 6th. Arrived at the island of Tahiti. Came to anchor off the town of Otaheite. Distance logged, from Honolulu, 2,876 miles.

June 7th. Mr. Kelly, the American Consul at Otaheite, visited the ship. Saluted him with 9 guns. Same day saluted the French and Tahitan flags with 21 guns each.

June 11th. Went to sea. The American bark Esther and Francis sailed the same day for San Francisco.

June 14th. Passed the island of Ohetiroa in 22 deg., 34 min. south latitude, and 150 deg., 13 min. west longitude.

July 2d. Hove-to in a gale from S. E. Same day the body of William Trainor, seaman, was committed to the deep.

July 4th. Spliced the main brace in honor of the day.

July 14th. Ship hove-to in a heavy gale from N. E. Battened down fore and aft.

July 15th. Passed Cape Horn in 57 deg., 20 min. south latitude, ship scudding under close reefed fore-sail and close reefed main-top-sail; weather cold, and snowing.

July 18th. Edward Watson, ordinary seaman, fell from the fore-top-sail-yard, while reefing top-sails in a gale of wind off the Falkland Islands, and was killed.

July 19th. The body of Edward Watson was committed to the deep with the usual ceremonies.

July 23d. Ship scudding in a heavy gale from S. W.

July 24th. The body of William Haviland, seaman, was committed to the deep.

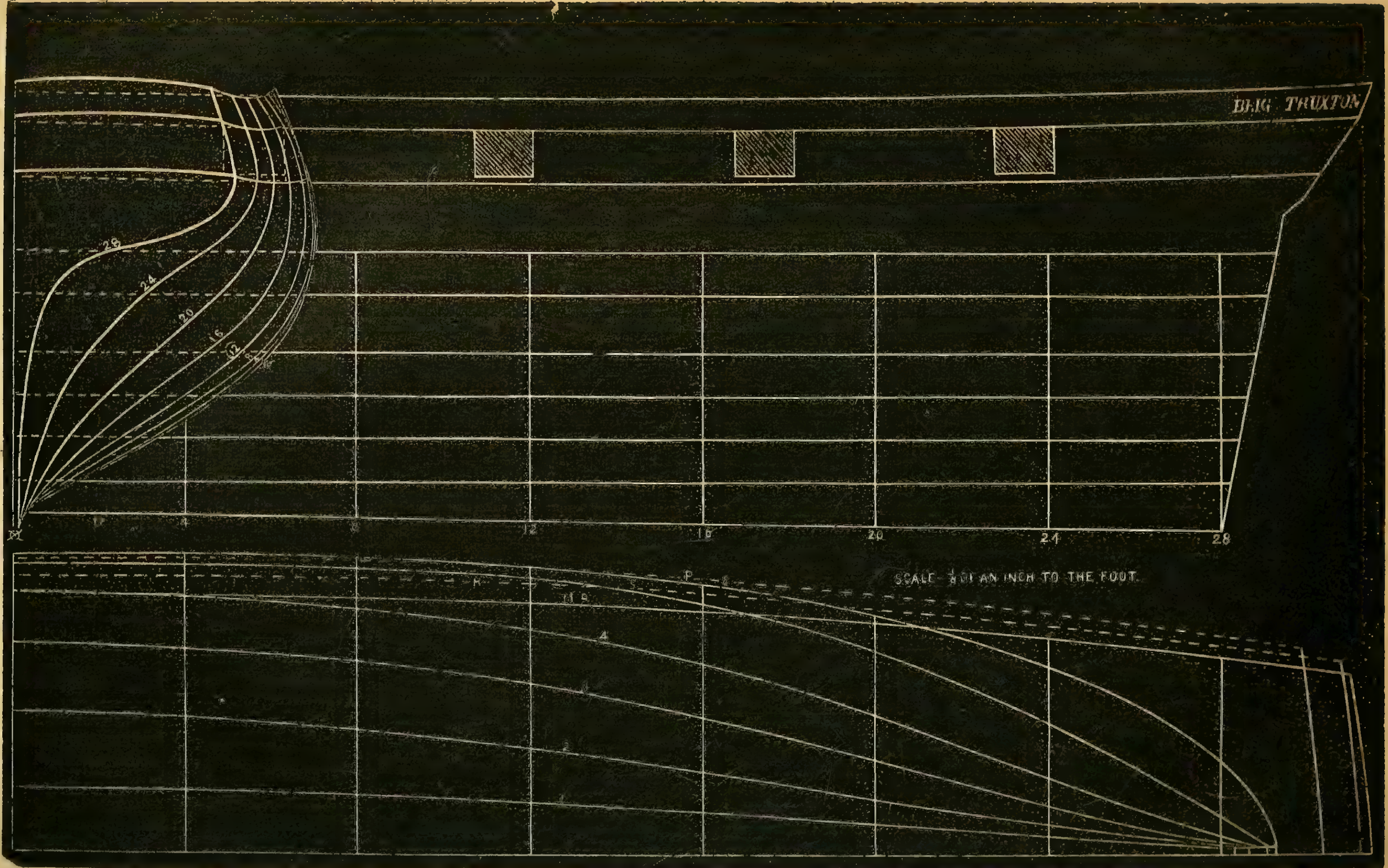
July 27th. Completed the circuit of the globe, having crossed the same parallel on the 23d day of November, 1850. Spliced the main brace upon the occasion. Lat. 26 deg., 29 min. south; long. 35 deg., 19 min. west.

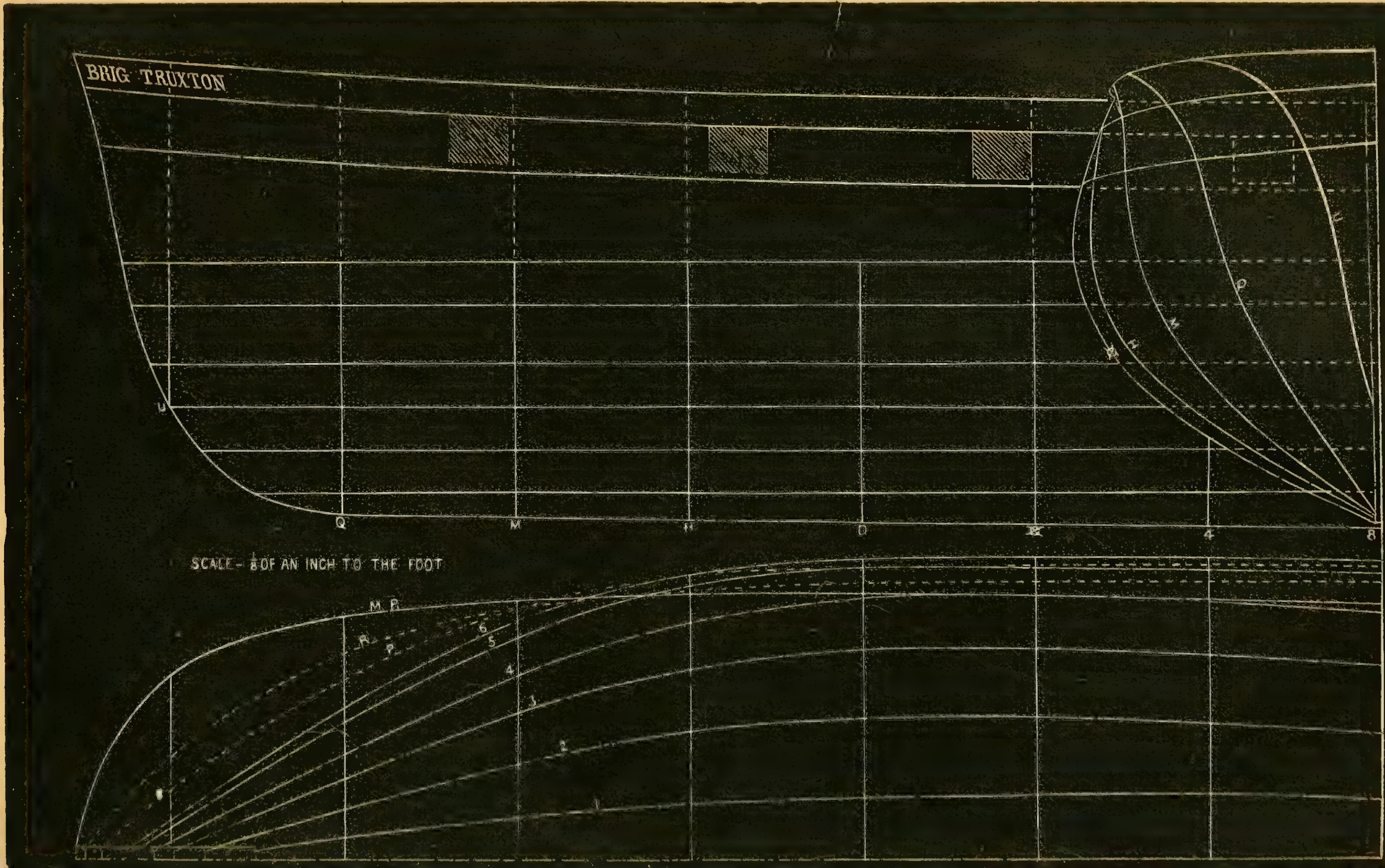
July 28th. Passed the latitude of Rio Janeiro, 22 deg., 56 min. south.

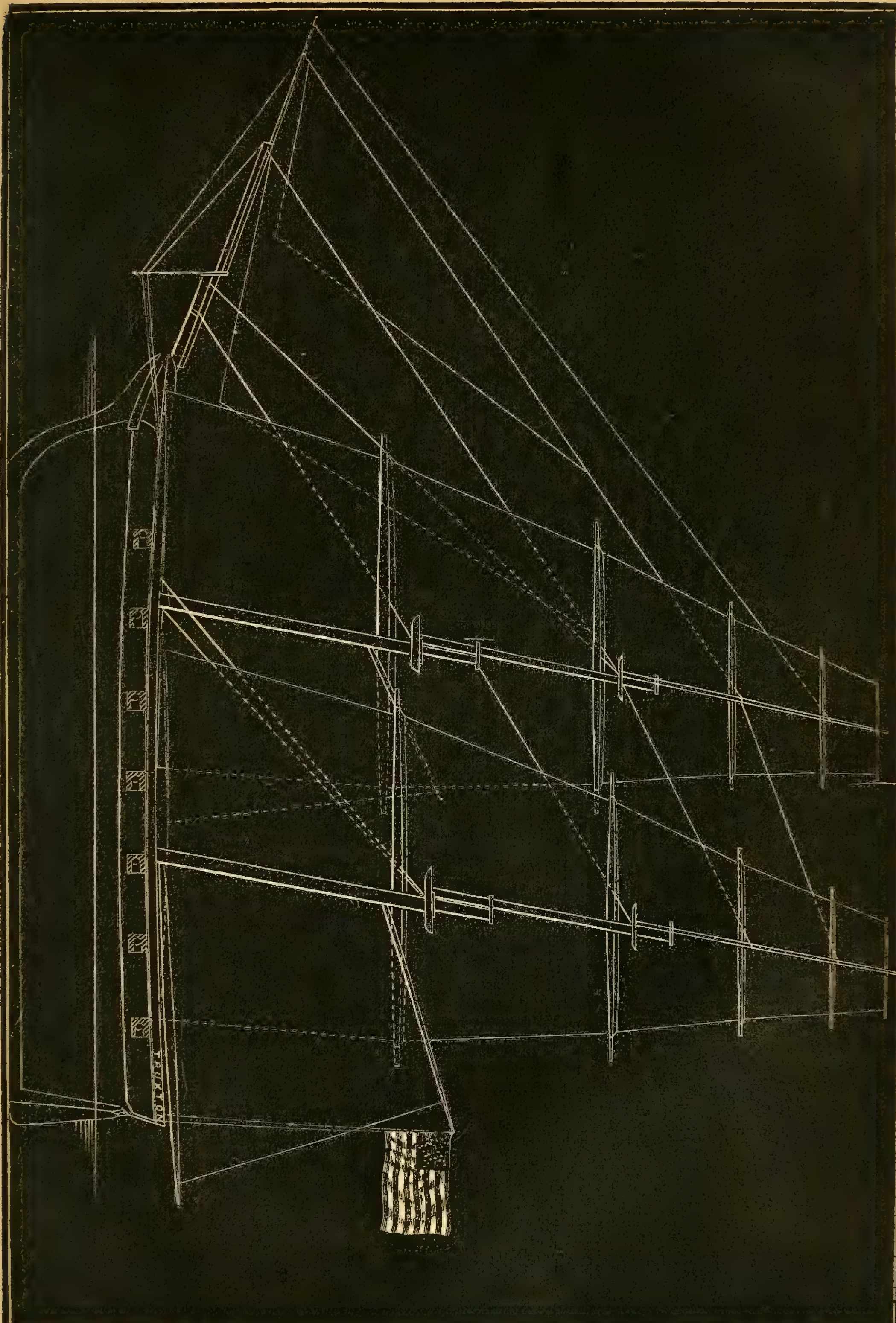
Aug. 3d. Came to anchor in Pernambuco roads. Distance logged, from Otaheite, 8,825 miles.

Aug. 4th. The American Consul at Pernambuco visited the ship. Saluted him with 9 guns. Saluted the Brazilian flag with 21 guns.

Aug. 5th. The Brazilian Admiral visited the ship. Saluted him with 13 guns. Salute returned by the Brazilian frigate Bertioga. Got under weigh the same day and went to sea.


BRIG TRUXTON
SCALE ¼ OF AN INCH TO THE FOOT.


BRIG TRUXTON
SCALE - 1/8 OF AN INCH TO THE FOOT


TRUXTON

Aug. 8th. Crossed the equator in 37 deg., 30 min. west longitude.
Sept. 1st. Arrived in Boston. Logged, from Pernambuco, 3,874 miles.
Number of miles sailed during the cruise, 59,933; number of deaths during the cruise, 22. Absent from the U. S., 3 years, 11 months, 14 days.

U. S. BRIG OF WAR TRUXTON.

THIS vessel was built by Francis Grice, Esq., Naval Constructor* at the Gosport Navy Yard, in 1842. In her day, short vessels were in fashion—she is a fair model of her time. We have been favored with a copy of her spar draft and calculations from her constructor, and are indebted to the U. S. Naval Lyceum for the use of her model.

Length between perpendiculars	100.00	feet.
" Keel for tonnage	82.60	"
Breadth beam, extreme	28.00	"
Height from lower edge of rabbet, to top gun-deck beam at side	14.25	"
Burthen in tons (carpenters)	308.$\frac{25}{95}$	tons.
Launching draught, Forward	7.00	feet.
" " Mean	8.50	"
" " Aft	10.00	"
Load draught, Forward	11.50	"
" " Mean	12.25	"
" " Aft	13.00	"
Depth of keel and false keel, clear of rabbet	1.83	"
Height of port-sill above load-line	5.54	"
Length of mean load-line, including rabbet of stem and stern post	98.79	"
Extreme breadth at mean load-line	27.16	"
Depth from mean load floating line to lower edge of rabbet of keel	10.41	"
Distance of the greatest transverse section, or ⊕ before the centre of the mean load floating line	7.70	"
Area of the greatest transverse section, or ⊕ to the mean load floating line, exclusive of keel, in square feet	182.56	
Area of ditto in proportion to its circumscribing parallelogram	.641	
Centre of gravity of the above area, below the mean load floating line	3.12	
Displacement of 1 foot of midship section, to mean load line, in tons	5.5½	t. c.
Area of the mean load floating line, exclusive of stem and stern post	2104.12	
Area of ditto in proportion to the circumscribing parallelogram	.784	
Centre of gravity of mean load floating line, before the centre of the line	1.29	
Area of estimated load floating line, with difference of draught of water	2130.58	
Area of ditto, before middle of length	1078.79	
Do. do., abaft " "	1051.79	
Area of vertical longitudinal section	1006.32	
Displacement to outside of plank, including keel, stem and stern post, to mean load floating line, in cubic feet	12413.00	

Ditto, in tons, sea water, 1026, oz.	3557.7
Displacement to outside of plank, exclusive of keel, stem and stern post, to mean load line, in cubic feet	12203.50
Displacement to outside of plank, exclusive of keel, stem and stern post, to mean load floating line in tons	349.7 t. c.
Ditto ditto in proportion to its circumscribing parallelopipedon	.436
Displacement per inch at the mean load floating line	5.15 t. c.
Displacement forward of the middle of the length of the mean load floating line, in cubic feet	6654.00
Do. do. in tons	$190.9\frac{3}{4}$ t. c.
Do. do. abaft ditto, in cubic feet	5759.00
Do. do. in tons	$164.17\frac{1}{4}$ t. c.
Centre of gravity of the whole displacement, including keel, stem and stern post, before the centre of the mean load floating line, in feet	2.50
Centre of gravity of whole displacement, below mean load floating line	3.41
Displacement forward of the centre of gravity of displacement, in cubic feet	6459.83
Do. do. in tons	$184.18\frac{1}{2}$ t. c.
Centre of gravity of the foregoing solid, before the centre of displacement	17.95
Displacement abaft the centre of gravity of displacement, in cubic feet	5953.17
Do. do. in tons	$170\ 8\frac{1}{2}$ t. c.
Centre of gravity of the foregoing solid, abaft the centre of gravity of the whole displacement	22.04
Contents of the immersed solid caused by the inclination from the mean to the estimated load floating line, in cubic feet	479.60
Do. do. in tons	$13.14\frac{1}{2}$ t. c.
Do. emerged by ditto, in cubic feet	383.14
Do. do. in tons	$10.19\frac{1}{2}$
Height of metre centre, above the centre of gravity of displacement, in feet	6.83
Do. do. above the mean load floating line	3.33
Centre of the fore mast, before the centre of the estimated load floating line, in terms of the whole length of the load line	.264
Do. of main mast, abaft ditto	.110
Length of the load floating line, with difference of draught of water, including rabbets of stem and stern post	98.66
Centre of ditto, abaft the greatest transverse section or ⊕	.270
Rake of fore mast, from a perpendicular to the load floating line, in degrees	12°
Do. of main mast	12°
Do. of bowsprit	20°
Surface of sails, including jib, fore and main course, fore, main and mizzen top-sails, fore, main and mizzen top-gallant sails, and spankers, in square feet	9789.60
Do. in proportion to the surface of load floating line	4.59
Surface of sails in proportion to the greatest transverse section or ⊕	53.61

Do., in proportion to the weight of the ship, in tons	29.11
Height of the centre of effort, above load floating line	42.97 feet.
Distance of centre of effort before the centre of gravity of displacement	1.47 "
Do. do. before the centre of load floating line	4.13 "
Displacement in tons when launched	168.14 t. c.
Do. do. loaded	355.7 "
Weight of ballast and tank, in tons	9.00
Number of rounds of shot	95
Weight of shot	13.11¼ t. c.
Weight of chain cable	10.2 "

Her armament consists of twelve guns, ten 32 pound carronades, and two long guns.

There appears to be no copy of the log of this vessel at hand to show her performances, but an extract of a letter from an officer on board, reads as follows:

"U. S. Brig Truxton, Port Grande,
"*Island of St. Vincent, Sept.* 25, 1844.

"My Dear Sir:—The Truxton is a beautiful vessel, a fast sailer, and fine sea boat We have beaten everything we have met; and the Saratoga, considered one of the fastest vessels on the station of any nation, has been obliged to yield us the palm after a long trial of speed," &c.

STEAM COMMUNICATION—ITS PROPOSED EXTENSION.

Through the politeness of Messrs. Van Zandt & Co., our attention has been called to the following project, which has been laid before the Austrian Government with some expectation of securing not only its approval, but its co-operation:

The policy of connecting the United States of America with the Continent of Europe, by direct lines of Mail Steamers of the first class, has been advocated by the most intelligent statesmen, both at home as well as recently abroad, and challenges the attention of our commercial men, if they would participate in its benefits.

Now that peace is restored to the great continental powers, and appearances justify the expectation that both the statesmen and capitalists of Europe are disposed to develope the resources of the continent, we in the New World aim to form commercial alliances, freed from the necessities as heretofore existing, of transmitting our mails, passengers, and products through the intervening Kingdom of Great Britain.

We therefore propose to aid in establishing lines of steamers, in direct communication with all the continental powers, that will stimulate such an undertaking by liberal arrangements, both with reference to the mails, passengers, and products of our several Governments.

In illustration of this subject, we submit the following scheme for a line of

eight steamers of the usual dimensions, to run from the City of New-York to the City of Lisbon, in Portugal; thence to Cadiz, in Spain, via Gibraltar; to Messina, in Sicily; to Venice and Trieste, in Austria.

This line would cross and connect with the East India Mails, as also all of the local Mediterranean lines, to the Sardinian, Turkish, and Egyptian ports.

Let us assume that eight first class steamers would form a line to leave each termini every fourteen days, and that the amount of capital required would be 500,000 dollars per each steamer, or a total sum of four millions of dollars.

To raise this sum, let the United States of America and the Austrian Government each loan *two millions of dollars* to a company who would equip said steamers, and be responsible for said capital of four millions of dollars, to be loaned on the eight steamers as security for said sum, and the interest at four per cent. per annum.

In consideration whereof, the mail service of said American and Austrian Governments to be done and performed for a given sum, to be deducted out of the quarterly interest to be paid said Governments.

The said eight steamers to be so built and equipped as to be susceptible of being converted into vessels of war.

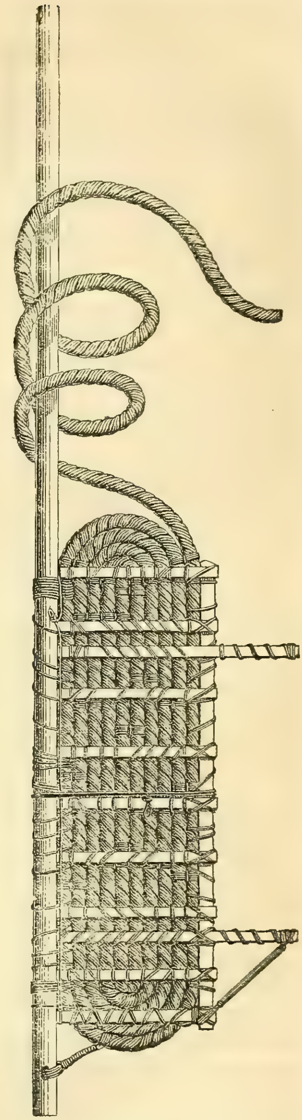
In the event of either the American or Austrian Government being embarked in war, four or one half of the said steamers to be surrendered up to each government, as a full consideration of the loan thereon.

The first four steamers arriving in the ports of Austria and America to be the halves taken in liquidation of the preceding clause of the proposed arrangement.

Should this outline of a truly important scheme for developing the commercial resources of Europe and America find favor either with the Government of Austria or its capitalists, it is proposed to enter more largely into the subject, and submit details that cannot fail to convince the most cautious, that a company obtaining this grant and loan from both governments, will, in the course of the second year of its administration, receive an income far greater than the one hundred and sixty thousand dollars of interest to be charged for the use of the four millions of dollars of capital required to establish such an important line of first class steamers.

An Example.—The King of Dahomey, an African monarch, (says a recent traveller,) keeps a drunkard, feeds him upon rum, and exhibits him at the customs, that his emaciated appearance may shame his people from making beasts of themselves.

INGENIOUS RUDDER.



Ship William Frothingham, from Calcutta for London, in a heavy gale, July 26, 1855, off the Cape of Good Hope, carried away foremast, mizzenmast and rudder, and was without one for four days.

Capt. B. K. Babbidge contrived a rudder like that in the accompanying engraving: stock of main topmast, studding sail boom, an 8 inch hauser, coiled as represented, lashed to stock, &c.; cross bars, (small ones) of spruce, 3 in. by 1 in.; head rails, projecting aft of rudder of oak, 3 by 4; fastened to ship by lower guys, hauled in at fore rigging; upper guys hauled in abaft main rigging.

Steering guys made fast to a topsail yard, across poop, abaft mizzen rigging, to which was attached the steering gear, which led to a wheel, made for the occasion, after manner of steamboat wheel.

Lowering Ship's Boats.—The difficulties and dangers attending the lowering of boats in rough weather at sea are very well known to seamen, and the accidents which have occurred to the most careful management are of so serious a nature as to render the impossibility of their occurrence a fact greatly desired. A method has been proposed by Mr. C. Clifford, in a pamphlet published by Messrs. Simpkin and Marshall, a model of which has been explained to us by the inventor himself, which, to our view of it, seems to meet every possible objection, and to secure a celerity of lowering, even to dropping a boat in the water, if required, and of checking her at pleasure, that fulfils this very important object. We shall not attempt to describe it, having satisfied ourselves that where proper attention is paid to the size of the pendants from the davits and their due arrangement, all that the inventor proposes can be accomplished. We shall therefore refer our readers to Mr. Clifford's pamphlet, where he quotes a passage from the late Act of Parliament, relating to merchant seamen, in regard to ships carrying boats in such a manner as to be "most available for immediate service," that it would be well for our seamen to look to.—*London Nautical Magazine.*

[From the London Mechanics' Magazine.

MERCHANT SHIPPING REGISTRATION ACT.

[Continued from page 386.]

Mr. Atherton has made up his mind, however—in spite of the admissions of all men practically interested in this matter, that the present law does afford a fair basis for levying tolls—that this shall only be done at the price of safety. Nothing, then, will serve him but to represent our "ships as sunk or water-logged, deck awash, full it may be of dead men's bones," in order to secure equity in levying tolls—a precious condition of things indeed! which may be applicable enough for his model ship of 1,000 nominal, but 3,000 real tonnage, but which we utterly repudiate.

It does not seem to have struck Mr. Atherton that possibly, without sinking ships, there may be a *tolerably fair* proportion between the whole internal measurement and the displacement when fully loaded, not varying for different ships so much as 5 or even 2½ per cent.—the nearest approximation to correctness which he himself aims at.

Now with regard to fixing the load water-line, we are told that hundreds of ships are instanced by Fincham in which the limit of draught or load-line as proposed by the constructor, is specified and recorded in feet and inches as the contemplated limit of loading. Granted. A large proportion of these ships, unless our memory fails us, are vessels of war. Now we speak under correction, for we cannot expect to have the same information on this point as a Government officer, whose duties necessarily make him acquainted with these matters; but we are under the impression that the fixing of the load water-line is necessary in ships of war, not so much to create a limit for the safe loading, as to keep the batteries at a proper distance above the water. We have heard it whispered—we still speak under correction—that it was not at all an uncommon thing, in the reign of the late surveyor of the navy, to hear of vessels constructed for a definite load-draught being immersed several feet beyond, and yet no danger, or suspicion of danger, to the *safety* of the ship resulted.

In the case of merchant vessels, the constructor doubtless would consider that the ship, if immersed only as far as his proposed deep-draught water-line, would display her good qualities in the highest degree; but we question whether he would presume to say that it would be *dangerous* to load her more deeply. Indeed, we question whether it would be an easy matter to find a constructor who would take on his shoulders the responsibility of fixing such a limit. At all events we believe we are right in asserting that no such quality is now attached to the constructor's load water-line. That the *difficulty* (we do not say impossibility) of fixing a limit to the safe immersion of ships is real, and not entirely attributable to "the cupidity of ship-owners and ship-charterers," Mr. Atherton might have satisfied himself by the reflection, that after all his inquiry and research, he is unable to suggest any nearer limit than one-*fourth*, or one-*fifth*, or one-*sixth* of the beam below the deck. We are left in a state of uncertainty whether in all cases the distance is proposed to be some *one* of these proportions, to be settled by "consultative deliberation," or whether all these are to be used according to circumstances. One would imagine, however, that a *long* ship, with comparatively small breadth, would, for safety, require the *water*-line at a greater distance below the deck than a shorter ship with a fuller beam. Mr. Atherton's suggestion, if adopted, would give exactly the opposite result.

We repeat, we only instance this to show how difficult it must be to fix this line, since such is the only suggestion that has occurred to the mind of Mr. Atherton, who is giving anxious attention to the whole question.

As regards the operation of the new law, Mr. Atherton has not touched the real point at issue. We maintain that the duty of government is to levy its tolls on vessels fairly, without giving an undue preference to any particular type of build. This is unquestionably done by the new system of basing these payments on the *actual internal measurement.* Whether a ship is built "with full lines burdensome for cargo or with finer lines more adapted for speed," its *exact* internal measurement is taken as the basis of levying the payments: and a builder or owner is therefore not obliged to think of anything but the form most suitable for his own purposes, in order to meet the requirements of the law. This surely is as much as can fairly be demanded.

We have now briefly discussed the principal points brought forward in Mr. Atherton's letter occasioned by our review; and again we congratulate him—on comparison of this with his former "recorded" view—on the important modifications which have taken place in his opinions, which leaves us room to hope that he may ultimately return to a sound state of mind on tonnage admeasurement.

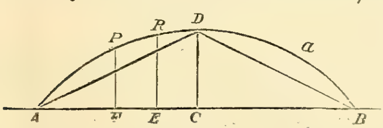
Our readers will remember how anxious Mr. Atherton was, that our note on tonnage measurement should be republished with all the corrections which had unfortunately been rendered necessary by its accidental admission without a final editorial revision. We, and probably our readers, expected some strictures on it. We are, however, gratified to find, that Mr. Atherton can find nothing to say against it. He qualifies the tacit approbation, however, by a comparison of it with "Mr. Peake's system," which we are told deserves the preference, "on the score of superior applicability and facility of being mentally understood by the operator," and that it includes a closely approximate measurement of the curved spaces, whether convex or concave; whereas, by Sterling's rule, "no notice whatever is taken of the curved portions above referred to; Peake's system is therefore the more correct of the two."

Now we do most sincerely trust that Mr. Atherton has formed his judgment on other questions brought prominently before the public in his paper and his subsequent additions to it, on more reliable data than he has brought to bear on this subject. We assert—and are ready to prove it necessary—that Sterling's rule is applicable to the measurement of the curved spaces, whether convex or concave, by which the real form of a ship between the extremities of the ordinates of measurement differs from a straight line; and that, taking notice of these portions of the ship is by no means a peculiarity of "Mr. Peake's system." We presume that the curve of sections, as explained in Mr. Peake's little work in Weale's Rudimentary Series, published in 1849, is that alluded to. At all events, we do not know of any other publication of his which contains a more elaborate exposition of his "system," or a different "system." For a complete elucidation of this mode of measurement, we refer our readers to p. 15, of the little work referred to.

After the statements of Mr. Atherton, our readers will be surprised to hear that Mr. Peake divides the length of his ship into a definite number of *equal* parts, as usual, and takes the vertical sections at each of the points of the division, *the areas of which he calculates strictly in accordance with the received rule.* It is here that the divergence from the usual method takes place.

He takes a base line, which he lays down to a certain scale, to denote the length of the ship, and at each point of division sets off lines at right angles to this to a fixed scale, proportional to, and therefore representative of, the areas; and through the extremities of these ordinates he draws a curve, which is the curve of sections. Now, with all this, we find no fault whatever. On the contrary, the representation of the solid contents of the ship by means of this curve is attended with several advantages. But the method by which that measurement is effected cannot so unreservedly meet with our approbation. The length being divided into two equal parts, and the ordinate to the curve drawn at the middle point, by joining the extremity of this ordinate with each extremity of the length, the figure is divided into two equal triangles, and two areas contained between the curve of sections and the chords before drawn. These two curvilinear areas are considered as portions of common parabolas, and so the calculation is effected.

According to Sterling's rule, the curves drawn through the extremities of each of three consecutive ordinates is a parabola, which evidently gives a closer approximation than Mr. Peake's rule. Thus, if A B be the length, C its middle point, and C D proportionate to the area of the section at C, A P D Q B the curve of sections, the area A B D is divided by A D, B D, into two equal triangles, A C D, B C D, and two curvilinear areas, A P D, D Q B; these latter are supposed to be parabolas. Now, it is evident that if A C be of considerable length, this supposition cannot be made without sensible error. If, however, E R, F P be two ordinates of the curve or "representative areas" at moderate equal distances, C E, E F, P R D might be taken, without sensible error, to be a parabola, and so for other portions. Peake's method of curves of sections, so far as any peculiarity in the measurement goes, is therefore decidedly *less correct* than Sterling's rule. The independent measurement of the appendages, as they are called, *i. e.* those portions of the vessel (as part of the stem, stern-post, and keel) which are not bounded by curves, belongs to no rule in particular.



Unless, therefore, we are grievously misinformed with respect to Mr. Peake's curve of sections, nothing can be more opposite to the truth than Mr. Atherton's ascription to the measurements made by means of it, as proposed by Mr. Peake, of the advantages of superior accuracy, applicability, and intelligibility. On the contrary, when the operator has once become familiar with the mode of calculating an area (which he has to do for all the sectional areas on Mr. Peake's method), all he has to do by Sterling's rule, is to apply this same method for the summation of the areas to obtain the cubic contents; whereas Mr. Peake requires him to lay off the representative areas accurately to a scale, to draw a fair curve through them, and then to obtain the greatest distance between the two chords and curve by trial; and all this to result in a measurement decidedly less accurate than would be obtained by following the usual rule. If we are mistaken in Mr. Peake's method, we shall be glad to have our error pointed out: but this is certainly what we gather from his little book in Weale's Series.

[There can be no doubt that the merchant shipping registration act of 1854, is the best that has yet been devised for sea-going vessels, and we recommend its adoption for the United States. But for licensed or coasting vessels, carrying deck-loads, we think that displacement or external measurement is best.]—*Eds.*

TONNAGE.

Having given our own views upon the subject of tonnage, and those of Mr. Atherton, (through the London periodical referred to,) we now furnish the testimony of another of equal importance, and we ask for it the attention of ship-owners and merchants generally.

By the polite attention of G. Moorsom, Esq., of Her Majesty's Customs, we have been put in possession of a letter from one of the most intelligent and practical, as well as the most extensive ship-owners of London. There is, in our judgment, so much of practical common sense in this letter, that the gentleman who sent, as well as the one who wrote it, will please excuse us for giving it a place in the magazine for the benefit of American ship-owners.

Glasgow, 8th July, 1856.

Dear Sir:—I have been unable sooner to acknowledge the receipt of your note of the 21st ult. You will no doubt be highly pleased, and much gratified, with the remarks in the U. S. Nautical Magazine, on the present system of tonnage admeasurement in this country. And you will also be satisfied with the passing observations on the schemes propounded by Mr. Atherton, and by Mr. Henderson.

I think I quite understand the difficulty that appears to the writer as stated in page 124, Vol. 4, of the magazine; but that does not in the least degree change my opinion of the perfect accuracy, and strict honesty of our mode of measurement.

I have been in the United States several times, and have frequently seen the disgraceful overloading of steamers, and of sailing craft, on their great lakes, rivers, and on the coasts—indeed, I have experienced much uneasiness on several occasions, from the overloading of vessels, not only in the United States, but also in Canada, and in New-Brunswick. It is true, however, that on the smooth and shallow waters of America, where navigation is carried on chiefly in the summer time—where craft of great length and beam, and of little depth, are required, and can only be used, a considerable portion of cargo may be carried on deck; but, then, these are vessels of the peculiar build, and built expressly for that trade; and when all owners, under the circumstances, can place themselves in the same position, so that no one can have any advantage over the other; and most probably the dues or port charges, if any at all, are not levied on the ton measurement of the vessels, but in some other way. To meet the proposed problem of "tonning an American lake or river steamer," &c., &c., I would just put it to the writer of the article to find a mode of measurement more equitable and just, by which to measure *all* the vessels of the United States, than that now under your care, seeing that it has become necessary either to adopt that, or some other, say a better, if it were possible. There can be no doubt that all covered-in spaces on their steamers ought to be measured. And that on such rivers as the Hudson, Mississippi, the lakes, St. Lawrence, &c., it might be more equitable to levy the dues on the quantity of goods, &c., &c., carried, than on the shells of vessels, or bottoms of vessels that now navigate these waters. There is no doubt, moreover, that many steamers and sailing craft, not only in the States, but in Canada, are lost by being overladen. Pray excuse this hastily written reply, and

I am, dear sir, yours truly,

Allan Gilmore.

G. Moorsom, Esq., London.

SECRETARY MARCY ON PRIVATEERING.

DEPARTMENT OF STATE,
WASHINGTON, July 28, 1856.

THE COUNT DE SARTIGES, &c., &c., &c.

The undersigned, Secretary of State of the United States, has laid before the President "The declaration concerning maritime law," adopted by the Plenipotentiaries of Great Britain, Austria, France, Prussia, Russia, Sardinia and Turkey, at Paris, on the 10th of April, 1856, which the Count de Sartiges, Envoy Extraordinary and Minister Plenipotentiary of France, has presented in behalf of the Emperor of the French to the government of the United States, for the purpose of obtaining its adhesion to the principles therein contained.

Nearly two years since, the President submitted, not only to the Powers represented in the late Congress at Paris, but to all other maritime nations, the second and third propositions contained in that "declaration," and asked their assent to them as permanent principles of international law. The propositions thus submitted by the President were:

"1. That free ships make free goods—that is to say, that the effects or goods belonging to subjects or citizens of a Power or State at war are free from capture and confiscation when found on board of neutral vessels, with the exception of articles contraband of war.

"2. That the property of neutrals on board an enemy's vessel is not subject to confiscation unless the same be contraband of war"

It will be perceived that these propositions are substantially the same as the second and third in the "declaration" of the Congress at Paris.

Four of the governments with which the negotiations were opened on the subject by the United States, have signified their acceptance of the foregoing propositions. Others were inclined to defer acting upon them until the return of peace should furnish a more auspicious time for considering such international questions. The proceeding of the Congress of the Plenipotentiaries at Paris will, as a necessary consequence, defeat the pending negotiations with the United States, if the two following propositions contained in Protocol No. 24 are acceded to: first, that the four principles shall be indivisible; and, second, that the Powers which have signed or may accede to the "Declaration" shall not enter into any arrangement in regard to the application of the right of neutrals in the time of war, which does not, at the same time, rest on the four principles which are the object of said "Declaration." As the indivisibility of the four principles and the limitation upon the sovereign attribute of negotiating with other Powers are not a part of the "Declaration," any nation is at liberty to reject either or both, and to act upon the "Declaration" without restriction, acceding to it in whole or in part. In deliberating on this important subject, it behooves all powers to consider, and, if they think proper, to act upon this distinction. All the Powers which may accede to that "Declaration" and the subsequent restrictions contained in the 24th Protocol, will assume an obligation which takes from them the liberty of assenting to the propositions submitted to them by the United States, unless they at the same time surrender a principle of maritime law which has never been contested—the right to employ privateers in time of war.

The second and third principles set forth in the "Declaration," being those submitted to other maritime Powers for adoption by this government, it is most anxious to see incorporated, by general consent, into the code of maritime law, and thus placed beyond future controversy or question. Such a result, securing so many advantages to the commerce of neutral nations, might have been reasonably expected but for the proceedings of the Congress at Paris, which require them to be purchased by a too costly sacrifice—the surrender of a right which may well be considered as essential to the freedom of the seas.

The fourth principle contained in the "Declaration," namely:—"Blockades, in order to be binding, must be effective; that is to say, maintained by a force sufficient really to prevent access to the coast of the enemy,"—can hardly be regarded as one falling within that class with which it was the object of the Congress to interfere; for this rule has not, for a long time, been regarded as uncertain, or the cause of any "deplorable disputes." If there have been any disputes in regard to blockades, the uncertainty was about the facts, but not the law. Those nations which have resorted to what are appropriately denominated "paper blockades," have rarely, if ever, undertaken afterwards to justify their conduct upon principle, but have generally admitted the illegality of the practice, and indemnified the injured parties. What is to be adjudged "a force sufficient really to prevent access to a coast of the enemy," has often been a severely contested question; and certainly the declaration which merely reiterates a general undisputed maxim of

maritime law, does nothing towards relieving the subject of blockade from that embarrassment. What force is requisite to constitute an effective blockade remains as unsettled and as questionable as it was before the Congress at Paris adopted the "Declaration."

In regard to the right to employ privateers, which is declared to be abolished by the first principle put forth in the "Declaration," there was, if possible, less uncertainty. The right to resort to privateers is as clear as the right to use public armed ships, and as incontestible as any other right appertaining to belligerents. The policy of that law has been occasionally questioned, not, however, by the best authorities; but the law itself has been universally admitted, and most nations have not hesitated to avail themselves of it; it is as well sustained by practice and public opinion as any other to be found in the maritime code.

There is scarcely any rule of international law which particular nations in their treaties have not occasionally suspended or modified in regard to its application to themselves. Two treaties only can be found in which the contracting parties have agreed to abstain from the employment of privateers in case of war between them. The first was a treaty between the King of Sweden and the States General of the United Provinces in 1675. Shortly after it was concluded the parties were involved in war, and the stipulations concerning privateers was entirely disregarded by both. The second was the treaty of 1785, between the United States and the King of Prussia. When this treaty was renewed in 1799, the clause stipulating not to resort to privateering was omitted. For the last half century, there has been no arrangement, by treaty or otherwise, to abolish the right, until the recent proceedings of the Plenipotentiaries at Paris.

By taking the subject of privateering into consideration, that Congress has gone beyond its professed object, which was, as it declared, to remove the uncertainty on points of maritime law, and thereby prevent "differences between neutrals and belligerents, and consequently serious difficulties and even conflicts;" so far as the principle in regard to privateering is concerned, the proceedings of the Congress are in the nature of an act of legislation, and seek to change a well-settled principle of international law.

The interest of commerce is deeply concerned in the establishment of the two principles which the United States had submitted to all maritime Powers, and it is much to be regretted that the Powers represented in the Congress at Paris, fully approving them, should have endangered their adoption by uniting them to another inadmissible principle, and making the failure of all the necessary consequence of the rejection of any one. To three of the four principles contained in the "Declaration," there would not probably be a serious objection from any quarter, but to the other a vigorous resistance must have been anticipated.

The policy of the law which allows a resort to privateers has been questioned, for reasons which do not command the assent of this government. Without entering into a full discussion on this point, the undersigned will confront the ordinary and chief objection to that policy by an authority which will be regarded with profound respect, particularly in France. In a commentary on the French ordinance of 1681, Valin says:—

"However lawful and time-honored this mode of warfare may be, it is nevertheless disapproved of by some pretended philosophers. According to their notions such is not the way in which the State and the sovereign are to be served, whilst the profits which individuals may derive from the pursuit are illicit, or at least disgraceful. But this is the language of bad citizens, who under the stately mask of a spurious wisdom and of a crafty sensitive conscience, seek to mislead the judgment by a concealment of the secret motive which gives birth to their indifference for the welfare and advantage of the State. Such are as worthy of blame as are those entitled to praise who generously expose their property and their lives to the dangers of privateering."

In a work of much repute, published in France almost simultaneously with the proceedings of the Congress at Paris, it is declared that—

"The issuing of letters of marque, therefore, is a constantly customary belligerent act. Privateers are bona fide war vessels, manned by volunteers, to whom, by way of reward, the sovereign resigns such prizes as they make, in the same manner as he sometimes assigns to the land forces a portion of the war contributions levied on the conquered enemy."—*Pistoye Duverdy des Prises Maritimes.*

It is not denied that annoyances to neutral commerce, and even abuses, have occasionally resulted from the practice of privateering; such was the case formerly more than in recent times; but when it is a question of changing a law, the incidental evils are to be considered in connexion with its benefits and advantages. If these benefits and advantages can be obtained in any other way, without injury to other rights, these occasional abuses may then justify the change, however ancient or firmly established may be the law.

The reasons which induced the Congress at Paris to declare privateering abolished, are not stated, but they are presumed to be only such as are usually urged against the exercise of the belligerent right.

The prevalence of Christianity and the progress of civilization have greatly mitigated the severity of the ancient mode of prosecuting hostilities. War is now an affair of governments. "It is the public authority which makes and carries on war; individuals are not permitted to take part in it unless authorized to do so by their government." It is a generally received rule of modern warfare, so far, at least, as operations upon land are concerned, that the persons and effects of non-combatants are to be respected. The wanton pillage or uncompensated appropriations of individual property by an army, even, in possession of an enemy's country, is against the usage of modern times. Such a mode of proceeding at this day would be condemned by the enlightened judgment of the world, unless warranted by special circumstances. Every consideration which upholds this sentiment in regard to the conduct of war on land, favors the application of the same rule to the persons and property of citizens of the belligerents found upon the ocean.

It is fair to presume that the strong desire to ameliorate the severe usages of war by exempting private property upon the ocean from hostile seizure, to the extent it is usually exempted on land, was the chief inducement which led to the "Declaration" by the Congress at Paris, that "privateering is, and remains, abolished."

The undersigned is directed by the President to say, that to this principle of exempting private property upon the ocean, as well as upon the land, applied without restriction, he yields a most ready and willing assent. The undersigned cannot better express the President's views upon the subject, than by quoting the language of his annual message to Congress of December 4, 1854:

"The proposition to enter into engagements to forego a resort to privateers, in case this country should be forced into a war with a great naval Power, is not entitled to more favorable consideration than would be a proposition to agree not to accept the services of volunteers for operations on land. When the honor or rights of our country require it to assume a hostile attitude, it confidently relies upon the patriotism of its citizens not ordinarily devoted to the military profession, to augment the army and navy so as to make them fully adequate to the emergency which calls them into action. The proposal to surrender the right to employ privateers is professedly founded upon the principle, that private property of unoffending non-combatants, though enemies, should be exempt from the ravages of war; but the proposed surrender goes but little way in carrying out that principle, which equally requires that such private property should not be seized or molested by national ships of war. Should the leading powers of Europe concur in proposing, as a rule of international law, to exempt private property upon the ocean from seizure by public armed cruisers as well as by privateers, the United States will readily meet them upon that broad ground."

The reasons in favor of the doctrine that private property should be exempted from seizure in the operations of war are considered in this enlightened age so controlling, as to have secured its partial adoption by all civilized nations; but it would be difficult to find any substantial reasons for the distinction now recognised in its application to such property on land, and not to that which is found upon the ocean.

If it be the object of the declaration adopted at Paris to abolish this distinction, and to give the same security from the ravages of war to the property of belligerent subjects on the ocean, as is now accorded to such property upon the land, the Congress at Paris has fallen short of the proposed result, by not placing individual effects of belligerents beyond the reach of public armed ships as well as privateers. If such property is to remain exposed to seizure by ships belonging to the navy of the adverse party, it is extremely difficult to perceive why it should not, in like manner, be exposed to seizure by privateers, which are in fact but another branch of the public force of the nation commissioning them.

If the principle of capturing private property on the ocean and condemning it as prize of war be given up, that property would, and of right ought to be, as secure from molestation by public armed vessels as by privateers; but if that principle be adhered to, it would be worse than useless to attempt to confine the exercise of the right of capture to any particular description of the public force of the belligerents. There is no sound principle by which such a distinction can be sustained—no capacity which could trace a definite line of separation proposed to be made, and no proper tribunal to which a disputed question on that subject could be referred for adjustment. The pretence that the distinction may be supported upon the ground that ships not belonging permanently to a regular navy are more likely to disregard the rights of neutrals than those which do belong to such

a navy, is not well sustained by modern experience. If it be urged that a participation in the prizes is calculated to stimulate cupidity, that, as a peculiar objection, is removed by the fact that the same passion is addressed by the distribution of prize money among the officers and crews of ships of a regular navy. Every nation which authorizes privateers is as responsible for their conduct as it is for that of its navy, and will, as a matter of prudence, take proper precaution and security against abuses.

But if such a distinction were to be attempted, it would be very difficult, if not impractical, to define the particular class of the public maritime force which should be regarded as privateers. "Deplorable disputes," more in number, and more difficult of adjustment, would arise from an attempt to discriminate between privateers and public armed ships.

If such a discrimination were attempted, every nation would have an undoubted right to declare what vessels should constitute its navy, and what should be requisite to give them the character of public armed ships. These are matters which could not be safely or prudently left to the determination or supervision of any foreign power, yet the decision of such controversies would naturally fall into the hands of predominant naval powers which would have the ability to enforce their judgments. It cannot be offensive to urge weaker powers to avoid as far as possible such an arbitrament, and to maintain with firmness every existing barrier against encroachments from such a quarter.

No nation which has a due sense of self-respect will allow any other, belligerent or neutral, to determine the character of the force which it may deem proper to use in prosecuting hostilities; nor will it act wisely if it voluntarily surrenders the right to resort to any means sanctioned by international law, which, under any circumstances, may be advantageously used for defence or aggression.

The United States consider powerful navies and large standing armies, as permanent establishments, to be detrimental to national prosperity, and dangerous to civil liberty. The expense of keeping them up is burdensome to the people. They are, in the opinion of this government, in some degree a menace to peace among nations. A large force, ever ready to be devoted to the purposes of war, is a temptation to rush into it. The policy of the United States has ever been, and never more than now, adverse to such establishments; and they can never be brought to acquiesce in any change in international law which may render it necessary for them to maintain a powerful navy or large regular army in time of peace. If forced to vindicate their rights by arms they are content, in the present aspect of international relations, to rely, in military operations on land, mainly upon volunteer troops, and for the protection of their commerce in no inconsiderable degree upon their mercantile marine. If this country were deprived of these resources it would be obliged to change its policy and assume a military attitude before the world. In resisting an attempt to change the existing maritime law that may produce such a result, it looks beyond its own interest, and embraces in its view the interest of all such nations as are not likely to be dominant naval powers. Their situation in this respect is similar to that of the United States, and to them the protection of commerce and the maintenance of international relations of peace appeal as strongly as to this country to withstand the proposed change in the settled law of nations. To such nations the surrender of the right to resort to privateers would be attended with consequences most adverse to their commercial prosperity without any compensating advantages. Most certainly no better reasons can be given for such a surrender than for foregoing the right to receive the services of volunteers; and the proposition to abandon the former is entitled, in the judgment of the President, to no more favor than a similar proposition in relation to the latter. This opinion of the importance of privateers to the community of nations, excepting only those of great naval strength, is not only vindicated by history, but sustained by high authority. The following passage in the treatise on maritime prizes, to which I have before referred, deserves particular attention:—

"Privateers are especially useful to those powers whose navy is inferior to that of their enemies. Belligerents, with powerful and extensive naval armaments, may cruise upon the seas with their national navies; but should those States whose naval forces are of less power and extent be left to their own resources, they could not hold out in a maritime war, whilst by the equipment of privateers they may succeed in inflicting upon the enemy an injury equivalent to that which they themselves sustain. Hence governments have frequently been known, by every possible appliance, to favor privateering armaments. It has even occurred that sovereigns, not merely satisfied with issuing letters of marque, have also taken, as it were, an interest in the armament. Thus did Louis the Fourteenth frequently lend out his ships, and sometimes reserve for himself a share in the prizes."

It certainly ought not excite the least surprise that strong naval powers should be willing to forego the practice, comparatively useless to them, of employing privateers upon

condition that weaker powers agree to part with their most effective means of defending their maritime rights. It is, in the opinion of this government, to be seriously apprehended that if the use of privateers be abandoned, the dominion over the seas will be surrendered to those powers which adopt the policy and have the means of keeping up large navies. The one which has a decided naval superiority would be potentially the mistress of the ocean, and by the abolition of privateering that domination would be more firmly secured. Such a power engaged in a war with a nation inferior in naval strength, would have nothing to do for the security and protection of its commerce but to look after the ships of the regular navy of its enemy. These might be held in check by one-half, or less, of its naval force, and the other might sweep the commerce of its enemy from the ocean. Nor would the injurious effects of a vast naval superiority to weaker States be much diminished if that superiority was shared among three or four great powers. It is unquestionably the interest of such weaker States to discountenance and resist a measure which fosters the growth of regular naval establishments.

In discussing the effect of the proposed measure—the abolition of privateering—a reference to the existing condition of nations is almost unavoidable. An instance will at once present itself in regard to two nations where the commerce of each is about equal, and about equally wide-spread over the world. As commercial powers they approach to an equality, but as naval powers there is great disparity between them. The regular navy of one vastly exceeds that of the other. In case of a war between them, only an inconsiderable part of the navy of the one would be required to prevent that of the other from being used for defence or aggression, while the remainder would be devoted to the unembarrassed employment of destroying the commerce of the weaker in naval strength. The fatal consequences of this great inequality of naval force between two such belligerents would be in part remedied by the use of privateers; in that case, while either might assail the commerce of the other in every sea, they would be obliged to distribute and employ their respective navies in the work of protection. This statement only illustrates what would be the case, with some modification, in every war where there may be considerable disparity in the naval strength of the belligerents.

History throws much light upon this question. France, at an early period was without a navy, and in her wars with Great Britain and Spain, both then naval powers, she resorted with signal good effect to privateering, not only for protection, but successful aggression. She obtained many privateers from Holland, and by this force gained decided advantages on the ocean over her enemy. Whilst in that condition, France could hardly have been expected to originate or concur in a proposition to abolish privateering. The condition of many of the smaller States of the world is now, in relation to naval powers, not much unlike that of France in the middle of the sixteenth century. At a later period, during the reign of Louis the Fourteenth, several expeditions were fitted out by him, composed wholly of privateers, which were most effectively employed in prosecuting hostilities with naval powers.

Those who may have, at any time, a control on the ocean, will be strongly tempted to regulate its use in a manner to subserve their own interests and ambitious projects. The ocean is the common property of all nations, and instead of yielding to a measure which will be likely to secure to a few—possibly to one—an ascendancy over it, each should pertinaciously retain all the means it possesses to defend the common heritage. A predominant power upon the ocean is more menacing to the well-being of others than such a power on land, and all are alike interested in resisting a measure calculated to facilitate the permanent establishment of such a domination, whether to be wielded by one power or shared among a few others.

The injuries likely to result from surrendering the dominion of the seas to one or a few nations which have powerful navies, arise mainly from the practice of subjecting private property on the ocean to seizure by belligerents. Justice and humanity demand that this practice should be abandoned, and that the rule in relation to such property on land should be extended to it when found upon the high seas.

The President, therefore, proposes to add to the first proposition in the "declaration" of the Congress at Paris, the following words:—"And that the private property of the subjects or citizens of a belligerent on the high seas shall be exempted from seizure by public armed vessels of the other belligerent, except it be contraband." Thus amended, the government of the United States will adopt it, together with the other three principles contained in the "declaration."

I am directed to communicate the approval of the President to the second, third and fourth propositions, independently of the first, should the amendment be unacceptable. The amendment is commended by so many powerful considerations, and the principl

which calls for it has so long had the emphatic sanction of all enlightened nations in military operations on land, that the President is reluctant to believe it will meet with any serious opposition. Without the proposed modification of the first principle, he cannot convince himself that he would be wise or safe to change the existing law in regard to the right of privateering.

If the amendment should not be adopted, it will be proper for the United States to have some understanding in regard to the treatment of their privateers when they shall have occasion to visit the ports of those powers which are or may become parties to the declaration of the Congress at Paris. The United States will, upon the ground of right and comity, claim for them the same consideration to which they are entitled, and which was extended to them, under the law of nations, before the attempted modifications of it by that Congress.

As connected with the subject herein discussed, it is not inappropriate to remark that a due regard to the fair claims of neutrals would seem to require some modification, if not an abandonment, of the doctrine in relation to contraband trade. Nations which preserve the relations of peace should not be injuriously affected in their commercial intercourse by those which choose to involve themselves in war, provided the citizens of such peaceful nations do not compromise their character as neutrals by a direct interference with the military operations of the belligerents. The laws of siege and blockade, it is believed, afford all the remedies against neutrals that the parties to the war can justly claim. Those laws interdict all trade with the besieged or blockaded places. A further interference with the ordinary pursuits of neutrals, in nowise to blame for an existing state of hostilities, is contrary to the obvious dictates of justice. If this view of the subject could be adopted, and practically observed by all civilized nations, the right of search, which has been the source of so much annoyance and of so many injuries to neutral commerce, would be restricted to such cases only as justified a suspicion of an attempt to trade with places actually in a state of siege or blockade.

Humanity and justice demand that the calamities incident to war should be strictly limited to the belligerents themselves, and to those who voluntarily take part with them; but neutrals, abstaining in good faith from such complicity, ought to be left to pursue their ordinary trade with either belligerent, without restrictions in respect to the articles entering into it.

Though the United States do not propose to embarrass the other pending negotiations relative to the rights of neutrals, by pressing this change in the law of contraband, they will be ready to give their sanction whenever there is a prospect of its favorable reception by other maritime powers.

The undersigned avails himself of this opportunity to renew to the Count de Sartiges the assurance of his high consideration. W. L. MARCY.

THE CAUSES AND REMEDY OF THE UNPROFITABLE STATE OF SHIP-BUILDING.

A correspondent of the London Artizan writes thus on the causes and remedy of the unprofitable state of shipbuilding. Hear him:

"Ship-building at the present time presents the strange anomaly of capitalists not being able to compete with men of comparatively small means in the construction of vessels; yet such is an admitted fact in the nineteenth century, which boasts of the immense improvements in the application of machinery to our daily wants; so that while in other branches of commerce the larger capitalists is driving the smaller out of the market by the means of expensive machinery, it is in ship-building quite the reverse, on account of the profits being so very precarious. With the present system, no one possessed of ordinary prudence would adopt it as a lucrative investment for capital; yet this is the case in one of the largest branches of commerce wherein England claims pre-eminence over the whole world. In other branches of commerce, we can import the raw material from the most distant parts of

the world, and return it to them in a manufactured state cheaper than it can be manufactured where it is produced, merely from those aids to labor which have rendered this country the workshop of the world, and which are continually decreasing the amount paid for labor: but in ship-building the amount paid for labor goes on increasing year by year, the effect of which will be the means of compelling our ship-builders to cease the building of new vessels. As it is, our most eminent builders are driven out of the market for low-classed vessels, depending entirely on the repairing of vessels for a living, and building first class vessels merely for their own use; the reason for such a state of things arises from the uncontrollable demands of the workman, and from the imperfect system in the management of the labor. The remedy forms a most important subject for consideration, so that we may place capital in its proper position; make builders more independent of the workman—make the labor of the shipwright less scanty in proportion to the price paid for it—find out a method by which sufficiently skilled labor can be easier produced on an emergency, and bring the shipwright to that proper position, with respect to his employer, which ought to exist in every well-conducted business. Such is the problem I have here proposed, and which ought to receive the most serious consideration of every one who has the interests of his country, and the improvement of ship-building, at heart; so as to enable this country to excel the rest of the world in economy and excellence of ship-building as it does in every other mechanical art.

Before proceeding with this inquiry, it will be necessary to state that the present practice in the construction of vessels has remained stationary for centuries; in consequence, it must either be admitted that the present system is perfection, or that it is radically wrong. In answer to this query it can safely be asserted that it is in such a state as we might imagine the cotton manufacture was in before the invention of the spinning-jenny—the introduction of the division of labor—and the other appliances which have rendered it so lucrative, and which have increased the cotton manufacture to its present immense extent. In ship-building, with a shipping trade of such magnitude as we possess, the adoption of such improvements would render it the most profitable investment in this age of progress, but from the magnitude of the operations required to carry out such improvements in ship-building, I am afraid no single capitalist would undertake them; it would require an energetic company to carry out such improvements so as to overcome the prejudice and the combinations of the workman. Old systems and notions must be discarded; new discoveries and appliances must be brought to bear on ship-building, for the purpose of affording fresh and larger openings for the employment of capital.

With these preliminary observations I would now ask, what is the remedy? Division of labor is of the first and greatest importance: if there are six divisions of labor required in making a pin, certainly twenty would not be too many in ship-building. The simple introduction of a minute division of labor would increase the produce of shipwrights' labor a hundred per cent. With the present system, or rather, non-system, the produce of labor is scanty—it is small in quantity, poor in quality, and of a kind but imperfectly adapted to supply existing wants; the remedy is obvious—the division of labor will increase the quantity, improve the quality, and render it more suitable to its purpose. The produce of labor is scanty, because ship-builders do not use aright the means of making it large that are within their

reach, nor avail themselves to the full advantage of the proper means which are of such immense advantage in other branches of commerce. The steam-engine, for example, has been invented and brought to a state of almost miraculous perfection, yet it is scarcely employed in ship-building, nor have machinery, the divisions of labor, nor, in short, any of the modern appliances of skill and science, been rendered available for the service of the shipwright. The reason that these helps to labor are not so employed is, that they are so costly as to exceed the means of any single capitalist to make them profitable: none but a powerful company, with large capital, can properly avail themselves of the advantages to be gained.

In this age of improvement, the great secret of success is in producing the article or the qualified workman in the shortest possible time; yet, in ship-building, it requires seven years to produce a shipwright, and then we have one who is generally imperfect in some part of the business. It was the system of being able to supply skilled work rapidly by the division of labor that enabled the engineers, a few years ago, to resist the unreasonable demands of their workmen: the system of a seven years' apprenticeship is playing into the hands of the workmen. But division of labor in ship-building, and the simplicity of each operation assigned to each workman, will not require that degree of skill necessary to finish the whole of the ship. Each division might easily be acquired in a month. The difficulty, then, of attaining the requisite skill, is diminished in the proportion of the one separate part to the whole, and with it the term of apprenticeship, or time spent in acquiring that skill. Besides which, from this undivided attention to a single part, a higher degree of excellence and despatch in that one part is attained, than if attention were distracted by the performance of many other parts. Lastly, since each separate process is assigned to a different workman, and every hand thus attains to the highest degree of skill in his own part, it results that the whole of the work, through all its stages, is performed in the best style, and the article is turned out complete, and of unrivalled excellence, in the shortest possible time.

The next important consideration after the division of labor is a form of vessel that shall possess the greatest advantage for the application of machinery; such a form can be obtained by adopting a celebrated French sectional form, combined with increased length, and which might aptly be termed an average of the forms adopted by our most eminent builders. This form would possess every requisite for a good merchant vessel. The form suggested would possess the following advantages:—4-5ths of the timbers, planking, deck, beams, &c., would be of the same form; and from the expansive nature of the form suggested, the same machinery would be applicable to all sized vessels; the form itself would create a saving of 10 per cent. in the material, and from its simplicity a great saving of labor would be effected, independent of the division of labor. Such a form would effect a complete revolution in the art of ship-building; and it is necessary for the successful and economical application of machinery to ship-building, so as to place it on a level with the gigantic improvements of the present century.

With respect to the application of machinery to ship-building, will it be credited that, with the great quantity of heavy material used in the construction of vessels, there is scarcely a yard in the kingdom—including her Majesty's dockyards—that possesses a traversing crane over the vessel. If such a crane be profitable for a contractor to erect over a single undertaking, how much more so would it be over a building slip, where a number of ves-

sels could be built under it? The greater portion of the material is carried by men—the dearest of all methods for the conveyance of material—in consequence of the absence of tram-roads and properly constructed yards, entirely adapted for ship-building.

In the application of sawing machinery a more minute division is absolutely necessary, and of the utmost importance, so as to make each operation easy to the most ordinary capacity, and enable the ship-builder to be more independent of skilled labor. It is my humble opinion that if it were contrived solely for each operation, viz., the siding of the timber and the turning out of the timber (keeping in view that 4-5ths of the timbers are the same form,) in connection with a better system in the bevelling and laying off the timbers, the produce of the sawing machinery could be increased 200 per cent. above Hamilton's Patent, at the sawing machinery in Woolwich dock-yard. Normand's (of Havre) style of giving the bevels a name is a step in the right direction.

And again, in the planking and decks with 4-5ths of it the same form, an ordinary machine for cutting mouldings, or planing, would produce the planking and decks complete for the side of the vessel, and at equally as cheap a rate; in fact, the greater part of the machinery required for ship-building has been already introduced in other arts; ship-building has only to adopt it to reap its advantages, without the great outlay of expense and experience which has brought it to its present perfection.

Lastly, it is from the system of making so large a part of each vessel of the same form, and of assimilating the process in the construction of vessels for the application of machinery, that the most stupendous improvements in ship-building will be effected. It is a well known fact that every operation which exists in the mere repetition of one single action, or set of actions, may be better executed by machinery, than by manual labor. Mechanical genius is not rare, but would quickly display itself in ample measure if only the operation of the application of a machine was offered to it. Hardly anything in the application of mechanism seems too difficult for execution, after the prodigies which have already been effected in that department; but then the work to be done by the machine must be large, otherwise the expense of its construction will not be repaid. The most sanguine or far-seeing imagination can hardly over-estimate the results to be expected from the future application of machinery to ship-building. By these means the wealth acquired by Arkwright, Peel, &c., by the introduction of machinery to the cotton manufacture, may easily be exceeded, and not a little fame will attach to the names of the promoters of the enterprise.

It is by the means of such appliances as have been here described that Great Britain has excelled the whole world in the economy and excellence of its manufactures; without them in ship-building, we are compelled to witness the humiliating fact that a great part of our shipping trade is carried on by American and colonial-built vessels,—a class of vessels the use of which completely solves the question, whether it is more profitable to possess two vessels costing £20,000 that will last ten years, or one vessel for the same sum to last twenty years. Let me answer this question by an abstract from the returns made by the Board of Trade for 1854. It appears that in that year there were built and registered in the United Kingdom 592 timber sailing-vessels, tonnage, 115,807: the number of colonial-built vessels, 66, tonnage, 43,003, all from the North American colonies—a large increase over the previous year. Of foreign-built vessels the number was

267, tonnage, 97,641, nearly a threefold increase over the previous year, and that there was 738 vessels, tonnage, 168,843, belonging to the United Kingdom wrecked in that year. By the above returns it appears that 25,-000 tons of colonial and foreign-built vessels were added to our mercantile navy over the united efforts of all the ship-builders of the United Kingdom; such returns proving that low-classed vessels are the most profitable and in the greatest demand.

What a reproach to the ship-building energies of this country, to allow such an amount of tonnage to be added to our mercantile marine by others than themselves! Well might our ship-builders during the late war find a great difficulty in supplying the wants of our Government, from the scarcity of shipwrights. It is to be hoped that the difficulty of supplying any future contingencies of the Government will enable it to see the immediate necessity of allowing ship-building timber to be imported free of duty, as well as foreign-built vessels. It is a strange anomaly of free trade, to fetter our ship-building trade with such a tax on their energies on the face of such an increase of low-classed vessels.

I have made a slight, although necessary deviation from my subject, to point out the immense increase of low-classed vessels (say a seven years' grade), in our carrying-trade, on which vessels, from the cheapness of the materials used in their construction, the labor forms the most important item in their cost. It is with this class of vessels, especially the larger size —the building of which is rapidly leaving this country—that the practical improvements here suggested become of such great importance. At the lowest calculation the labor, by means of the division of labor, machinery, &c., will be decreased 70 per cent.; by the adoption of the form previously suggested a saving of material of 10 per cent.; and, with the duty, if taken off timber (an additional 5 per cent.,) it may safely be estimated that such appliances would reduce the cost of a vessel 30 per cent., and she would, at the same time, possess the additional advantage of being British built.

Such are the pecuniary advantages offered to the British capitalist, at a time when capital is seeking fresh fields for investment. It may safely be asserted that no other branch of commerce offers such advantages, and capital thus invested would give such a stimulus to our ship-building trade as to enable us to re-assert our superiority over the rest of the world in the economy and excellence of our vessels. When we consider the immense extent of our shipping trade, and its continual increase, with a loss of 700 vessels every year, the demand for vessels must always be large. All the necessary requirements are already in existence to produce such a demand as to enable these suggestions to be carried out to the greatest extent, and, consequently, in the most profitable manner. It is a source of wealth we possess within ourselves, that requires only to be revealed to produce the most astonishing results. With such means, ship-building then could only be carried on by the large capitalist—the mere adventurer not being able to compete—consequently, it would be the means of restraining the trade within its legitimate requirements, and preventing those serious fluctuations in the value of shipping which are so prejudicial to both the ship-builder and ship-owner. It is time that this modern cup of Tantalus was destroyed, which is ever raising hopes of success to those interested in our shipping trade, to find them utterly prostrated by the mere adventurer, at that point when a profitable return for their capital seemed to be within their grasp.

In conclusion, it is the interest of every well-wisher to our naval supre

macy to give this subject his most serious consideration, so as to raise the science of naval architecture and the art of ship-building to that proud position of being one of the most scientific and profitable investments of capital of the day; and I again assert, that it will only be effected by means of a powerful company becoming the focus for condensing those conflicting opinions in the form of vessels, which are so detrimental to the best interests of the science of naval architecture.

R. ARMSTRONG.

There is much in the above remarks of the writer, which demand the careful consideration of the ship-building interests on this side of the Atlantic. The application of machinery to the construction of vessels has long been advocated by us, and the abundance of material and skilled labor in the United States, furnishes abundant reason for the adoption of those suggested improvements. The enormous waste of timber as well as labor in the drudgery of the axe, should at once lead us to a more practical application of the genius with which this country abounds, in order to a more complete development of our great resources in this branch of industrial interests.—[*Eds.*

THE EASTERN STEAM-SHIP COMPANY'S GREAT SHIP.

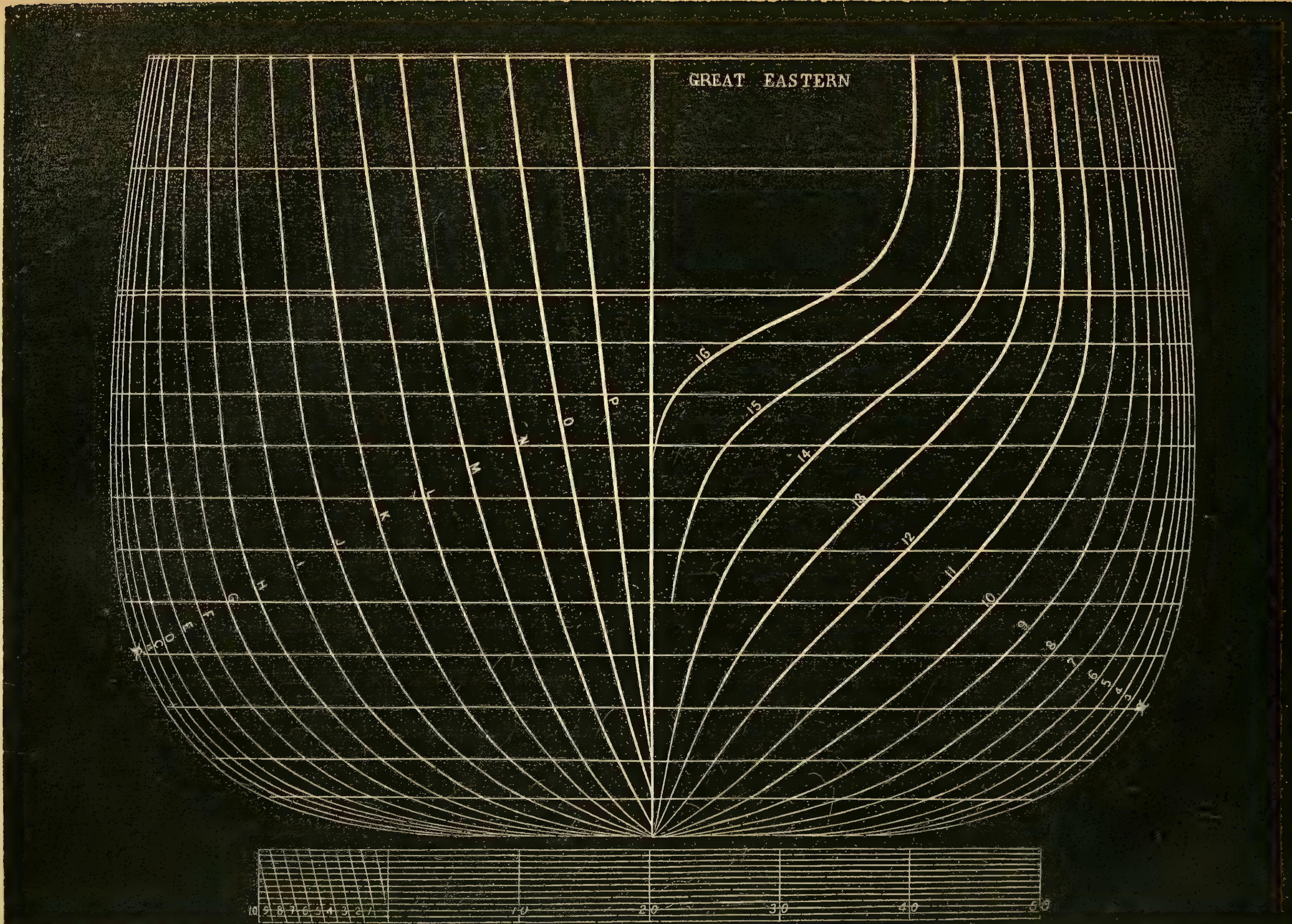
[Continued from London Artizan.]

IN continuation of our notice of the great ship now in course of construction at Millwall, on the Isle of Dogs, we this month give a sectional plan from *the working draft*, which exhibits a body plan-view.

We have already referred to the boldness of the conception and the design of this great naval construction being due to Mr. Brunel; and on carefully examining the details, no disappointment is experienced at any point or part of the whole; every precaution that human foresight or ingenuity could provide has been adopted in carrying out the work, to insure the greatest strength, combined with the least weight and expenditure of materials. Thus, through the entire length of the ship, at present completed, the cellular construction of the sides, the bottom, and the main deck, converts the whole into one immense wrought-iron tubular bridge or beam. Moreover, the structure is further strengthened by ten water-tight iron bulk-heads, 60 feet apart; and again, by two continuous walls of iron, about 36 feet apart, running longitudinally from the after (screw) engine-room to the cargo-space forward, a distance of about 350 ft., and forming a series of parallelograms 60 ft. × 36 ft.; in these divisions there is no weakening by the introduction of doorways, passages, or such like openings below the line of the second deck.

The general arrangement of the whole of the engines, boilers, and machinery for propelling the ship will be described, and will also show the whole of the internal construction of the vessel, throughout its entire length. by means of three longitudinal views, with the details accurately drawn and the principal dimensions figured thereon.

The sides, as we have already stated, are composed of two thicknesses of iron plate, three quarters of an inch in thickness, and carried up to 8 ft. above deep-load-line, 3 ft. apart, being framed into cellular spaces by webs


GREAT EASTERN

of plate-iron running longitudinally throughout the length of the vessel so constructed; these webs are secured to the plates by angle-irons, to which they are rivetted, as shown in Plate No. 1, which exhibits also the manner in which the plates are lapped. There are thirty-three longitudinal webs or ribs disposed throughout the bottom and sides of the ship in the manner shown, the distances between them so varying as to give the required amount of strength and resistance at the proper points. Each of these cellular spaces are rivetted and caulked water-tight, and, by means of sea-cocks and connections, water may be admitted into any required number of them in any part throughout the height on either side of the ship, by which means proper trim may be given to the ship, and a novel system of water-ballasting is thus introduced; or, if necessary, water may be admitted into the whole of the divisions on one side, so as to give her a sufficient "list" to enable repairs or re-painting to be done to her bottom. There being no keel and no ribs springing from it, as from a back-bone, the ordinary mode of ship-building has been ignored. It will be perceived that the hull is composed of two skins, with the ribs laid between them longitudinally instead of transversely; these, taken in conjunction with the subdivision of their length; the two main longitudinal walls of iron, the ten iron bulkheads, and the double main-deck, formed with cellular compartments similar to the bottom and sides, convey to the mind something like a correct idea of the vast strength and perfect unity of the whole structure.

In our next we purpose giving the most important of the practical details of that portion of the work which relates to the construction of the ship, illustrating them as far as possible.

We then propose to describe and deal with the construction and arrangement of the ship in detail, following it with a description as designed and furnished by Messrs. J. S. Russell & Co.

Of the many ingenious contrivances for labor-saving and other purposes connected with the economy of the ship, its proper working, and safe navigation, which have been designed for use on board, we will hereafter and in due time give accurate details: but which it is impossible at the present time to do. Moreover, of the equipment of the vessel, the number of masts and their disposition, nothing is yet definitely arranged. And thus until these essential points are finally determined, it would be a wasteful expenditure of our time and space to deal with them speculatively.

THE DANGERS OF STEAM.—By the law of Congress, inspectors have been appointed to determine the qualities of steam boilers, and of their attachments to the vessels in which they are placed. The vessel burns up, and *afterward* the inspector learns that the boiler was incased with wood instead of iron. The boiler explodes, and *afterwards* the inspectors learn that the boiler had some weak parts. In the name of humanity, can there not be a set of inspectors selected, who will determine these defects in the vessel and boilers *beforehand, and expose them ?*

SEA WAVES AND SEA SICKNESS.

"THE old vague account of waves being "mountains high" was well known to be an exaggeration; but we do not think even philosophers were prepared for the statement made at a meeting some years since of the British Scientific Association by Dr. Scoresby, that they averaged no more than 20 feet in altitude, and rarely exceeded 28 feet. The popular impression, principally produced by marine painters, that waves formed valleys thousands of yards across, down the sides of which ships slid as though they were about to be engulphed, seems to have been equally erroneous, as the maximum length of ocean waves, according to the same authority, is 600 feet, whilst in a moderate gale they are only 300, and, in a fresh sea, about 120 feet in length. A moment's consideration of these facts leads to the conclusion that long ships must have a great advantage over short ones with respect to the rapidity with which they make their journeys, as it is quite evident that whilst the latter have to perform their voyages by making a series of short curves —much to the impediment of their progress, and to the discomfort of their inmates—the former, by ruling the waves with their commanding proportions, make shorter and smoother passages. As steamers grow larger and larger, sea sickness must therefore gradually diminish." The above we copy from the Scientific American.

This is a mistake. It by no means follows that an increase in the length or size of vessels as now built, results in the decrease of motion, and consequent sea sickness. Some of the largest steam-ships afloat are much more uneasy and irregular in their motion than some other vessels of half their size—the Persia, for example, is far from being an easy ship, either in her longitudinal or transverse motions. The question of increased length has nothing to do with the problem of practical stability apart from the shape; the farther the weight of the extremities is placed from the centre of buoyancy, while the weight itself is not diminished, and perhaps increased, the greater *proportionately* will be the motion of the vessel. *The Great Eastern will roll beyond measure,* consequent upon her shape, and this would be the case, were she either wider or narrower, while the general principles of her shape remains unchanged. The curvature formed in the line of the vessel's length by the motion of the sea, is not the resultant of the vessel's size, length, or tonnage, but of her shape, upon which everything for stability depends. The principal dimensions of a vessel should never influence her shape. It is because the dimensions alone have invariably been the text book, by which the form of vessels have been determined, that so little is known of elementary shape for navigable purposes in the commercial world. The sea travellers of the world will bear us out in the assertion, that they are not the less subjected to sea sickness in large steamers than in small ones—as a general rule.

TONNAGE OF THE LAKES.

In order that our Nautical, Mechanical and Commercial readers may form a proper estimate of the great and growing commerce of the lakes, John J. Henderson, Esq., of Buffalo, has prepared the following statement for the U. S. Nautical Magazine and Naval Journal. Mr. H. prepared a similar statement of the vessels built during the year 1854, and those on the stocks to be launched in the spring of 1855, which showed a tonnage enrolled and licensed at the several American ports, embracing 110 steamers, 97 propellers, 33 barques, 101 brigs, 639 schooners, and 216 sloops and scows; making an aggregate of 237,830 tons, and valued at $10,185,000. This was an increase, in five years, of 276 vessels, of 84,376 tons, and in value amounting to $2,317,000.

The new tonnage added in 1854, was as follows:

Total steamer tonnage	6,448 39
" Propeller "	5,163 47
" Barque "	5,729 00
" Brig "	3,930 00
" Schooner "	19,469 00
Grand total	40,739 86

VESSELS BUILT IN 1855.

In 1855 there were built on the lakes, as appears by the statement which we publish below—

3	Steamers, tonnage	1,695
8	Propellers, "	4,213
4	Tugs "	251
2	Barques, "	776
6	Brigs, "	1,742
105	Schooners, "	28,752
128	Total "	37,429

VESSELS BUILT IN 1856.

In 1856, to the 10th of August, there were built and launched on the lakes, the following:

3	Steamers, tonnage	2,000
22	Propellers, "	12,755
5	Tugs, "	895
5	Barques, "	2,438
1	Brig, "	434
121	Schooners, "	34,828
157	Total "	53,350

This gives our lake tonnage an increase in two years, of

6 Steamers, of	3,695 tons.	
30 Propellers, of	16,968 "	
9 Tugs, of	1,146 "	
Total steam		21,809 tons.
7 Barques, of	3,214 tons.	
7 Brigs, of	2,176 "	
226 Schooners, of	63,580 "	
285 Total sail		68,970 tons.
Grand total		90,779

This, it must be remembered, embraces only the vessels launched and in commission. There are steamers, propellers, tugs, and innumerable sail vessels still on the stocks at the several American ports on the lakes, which will be launched this summer, in time for the fall trade, and which will swell the total tonnage to at least 100,000 tons for two years. The value of this new tonnage is as follows:

Steam tonnage in 1855	$395,000	
" " in 1856	1,132,000	
		$1,527,000
Sail " in 1855	$1,213,300	
" " in 1856	1,604,450	
		2,817,750
Grand total		$4,344,750

There is nothing in the history of the commerce of the world that will bear any comparison to the increase of the commerce of the lakes for the past few years. As the Western States become settled, and their resources developed, additional facilities are required for transporting to market their surplus productions; and enormous as is the increase in the new tonnage added from year to year, it is still barely adequate to meet the wants of the Western trade. Excepting a few weeks during the summer, when farmers are busy in securing their crops, and but little produce is brought into Western markets, the large fleet of vessels, numbering between *twelve and thirteen hundred*, find all they can do in transporting to market the produce of the great West, and carrying back merchandise, manufactures, &c.

The list which we give below, of vessels launched this year, is probably incomplete; and it may very possibly happen that the amount of tonnage set down opposite the names of some of the vessels may in a few instances be either above or below the exact amount. We have taken nearly all our figures from notices of new vessels, which have from time to time appeared in our exchanges, and it may have occurred that the tonnage was given before the vessels were measured. We would thank our lake contemporaries to supply any omissions that they may notice, and correct any errors that may strike them in our statement, as we are desirous of procuring a complete and perfect list.

The following table will show the rig, name, tonnage, and value of American vessels built at the several lake ports during 1856, with the ports at which they were built:

Rig.	*Name.*	*Where built.*	*Tons.*
Steamer	Western Metropolis,	Buffalo,	1,800
"	Gem,	Newport,	100
"	Alida,	Saginaw,	100
Total tons			2,000
Total value		$210,000	
Propeller	Mineral Rock,	Buffalo,	555
"	Adriatic,	do	595
"	Tonawanda,	do	822
"	Neptune,	do	675
"	Ontonagon,	do	560
"	International,	do	500
"	Free State,	do	550
"	Acme,	do	762
"	Euphrates,	do	575
"	Orantes,	do	575
"	Araxes,	do	575
"	J. Barber,	Cleveland,	263
"	Cuyahoga,	do	601
"	Mohawk,	do	789
"	Iron City,	do	565
"	Pittsburgh,	do	606
"	Evergreen City,	do	560
"	Racine,	do	560
"	Charles Mears,	do	272
"	Kenosha,	do	645
"	Elmira,	do	600
"	Alleghany,	Milwaukee,	550
Total Tons			12,755
Total value		$847,000	
Propeller Tug	E. P. Dorr,	Buffalo,	375
"	Tarlton Jones,	Chicago,	150
"	S. A. Page,	Oswego,	140
"	Walter McQueen,	Buffalo,	130
"	Name not known,	Saginaw,	100
Total tons			895
Total value		$75,000	
Barque	De Soto,	Cleveland,	583
"	B. A. Stanard,	do	603
"	J. V. Ayer,	do	382
"	Adriatic,	Clayton,	380
"	Hans Crocker,	Milwaukee,	490
Brig	E. W. Cross,	Oswego,	434
Schooner	Storm King,	Buffalo,	380
"	Racer,	do	377
"	Correspondent,	do	294
"	Resolution,	do	294
"	W. B. Hibbard,	do	294
"	Kate Hayes,	do	349
"	C. N. Johnson,	do	368
"	Rapid,	do	260
"	Hiawatha,	do	308
"	San Jacinto,	do	475
"	Rival,	do	303
"	Nicaragua,	do	314
"	S. H. Lathrop,	do	314
"	Goldfinch,	do	334
"	Ostrich,	do	350
"	Wm. Fiske,	do	400
"	Granada,	do	312
"	Bohemian,	do	327
"	Messenger,	do	353
"	Lancaster,	do	402
"	Live Yankee,	do	260
"	Charmer,	do	218
"	Huntress,	do	350
"	Athenian,	do	330
"	Circassian,	do	350
"	Baltic,	Cleveland,	367
"	Defiance,	do	350
"	W. B. Castle,	do	218
"	Egyptian,	do	372
"	Middlesex,	do	396
"	D. J. Norris,	do	347
"	J. L. Newhouse,	do	378
"	Dean Richmond,	do	377
"	J. H. Tiffany,	do	367
"	Gold Hunter,	do	368
"	M. S. Scott,	do	360
"	Star of Hope,	do	364
"	Miami,	do	382
"	Summit,	do	318
Schooner	Vanguard,	Cleveland,	392
"	Midnight,	do	382
"	Muskingum,	do	382
"	S. B. Pomeroy,	do	531
"	Sweepstakes,	do	457
"	E. C. Roberts,	do	379
"	Nonpareil,	Milan,	305
"	Lively,	do	294
"	Monteagle,	do	305
"	St. James,	do	302
"	Surprise,	do	294
"	Cuba,	do	295
"	Emeu,	do	310
"	H. L. Whitman,	do	295
"	Dardanelles,	do	308
"	May Queen,	do	300
"	Republican,	Huron,	334
"	Shook,	do	361
"	Clyde,	do	307
"	Kelpie,	do	177
"	B. Parsons,	Vermillion,	320
"	F. T. Barney,	do	354
"	New London,	do	340
"	Milton,	do	259
"	Ironsides,	do	332
"	W. H. Willard,	Black River,	180
"	John Webber,	do	200
"	Leader,	do	339
"	Kyle Spangler,	do	349
"	Adriatic,	Ashtabula,	191
"	St. Paul,	Erie,	303
"	St. Anthony,	do	303
"	St. Andrew's,	do	303
"	St. Peter,	do	303
"	Wide Awake,	Madison Dock,	354
"	Sioux,	Fairport,	165
"	Orleans,	do	41
"	Corinthian,	Irving,	360
"	Circassian,	do	354
"	C. C. Trowbridge,	Detroit,	332
"	H. H. Brown,	do	257
"	Sea Whistle,	do	109
"	Maize,	Perrysburgh,	356
"	Fremont,	do	275
"	Miami Bell,	Toledo,	372
"	Wyandotte,	Newport,	452
"	R. J. Skidmore,	Trenton,	140
"	Cataract,	Sandusky,	412
"	Starlight,	Saginaw,	402
"	John Hibbard,	Port Huron,	95
"	R. B. Hubbard,	Port Clinton,	340
"	Storm Spirit,	Port Huron,	223
"	Gertrude,	Twin Rivers,	98
"	Guido,	Manitowoc,	168
"	H. Rand,	do	136
"	S. Bates,	do	173
"	Persia,	Chicago,	131
"	Revolving Light,	Henderson, N. Y.,	200
"	Shanghai,	Milwaukee,	215
"	Rose Dousman,	do	135
"	Advance,	do	263
"	Brilliant,	do	160
"	Pauline,	do	175
"	Bell Atkins,	Wilson,	394
"	Meteor,	do	85
"	Eagle Wing,	Clayton,	360
"	Northern Belle,	do	356
"	Horace Greeley,	Pultneyville,	84
"	Joseph Cochrane,	Charlotte,	326
"	S. G. Andrews,	do	256
"	Delos De Wolf,	Oswego,	350
"	Algerine,	do	381
"	Dreadnought,	do	412
"	Titan,	do	366
"	Acontias,	do	374
"	Mary Jane,	Sheboygan,	85
Total tons			37,700
Total sail value		$1,604,450	

	No.	*Tonnage.*	*Value.*
Steam	30	15,650	$1,132,000
Sail	127	37,700	1,604,450
Total	157	53,350	$2,736,450

The above list comprises three steamers, twenty two propellers, five tugs, five barques, one brig, and one hundred and twenty-one schooners; making a total of *one hundred and fifty-seven* vessels.

The following table will show the rig, names, tonnage and value of all American vessels built on the lakes during the year 1855, with the ports at which they were built:

Rig.	*Name.*	*Where built.*	*Tons.*
Steamer	Forest Queen,	Newport,	462
"	Planet,	do	1,153
"	Union,	Buffalo,	80
Total tons			1,695
Total value		$110,000	
Propeller	Chicago,	Buffalo,	758
"	Relief,	do	362
"	Rescue,	do	285
"	Potómac,	Cleveland,	730
"	Jersey City,	do	633
"	T. U Bradbury,	do	546
"	Old Concord,	Newport,	457
"	Mary Stewart,	do	442
Total tons			4,213
Total value		$260,000	
Tug	G. O. Vail,	Albany,	54
"	Dime,	Buffalo,	47
"	Mary Bell,	do	75
"	President,	do	75
Total tons			251
Total value		$25,000	
Barque	Fontenelle,	Cleveland,	370
"	John Sweeney,	Buffalo,	406
Brig	Canopus,	Huron,	378
"	Gladiator,	Sheffield,	210
"	Sebastopol,	Toledo,	152
"	Wm. Lewis,	Oswego,	315
"	R. R. Lummis,	Sodus,	227
"	B. F Gardner,	Sheboygan,	460
Schooner	Convoy,	Buffalo,	375
"	Rainbow,	do	342
"	Gerrit Smith,	do	357
"	Sophia Smith,	do	366
"	Bay State,	do	340
"	Collingwood,	do	379
"	Golden Harvest,	do	376
"	Grapeshot,	do	369
"	Curtis Mann,	do	396
"	Wings of the Wind,	do	370
"	C. L. Abell,	do	64
"	John P. Hale,	do	360
"	Contest,	do	379
"	Eliza Logan,	do	369
"	Moselle,	do	331
"	L. B. Shepard,	do	290
"	Altair,	do	429
"	Perseverance,	do	310
"	Yankee Blade,	do	355
"	J. F. Tracy,	do	203
"	Lookout,	do	313
"	Enterprise,	do	296
"	Antelope,	do	347
"	Theodore Parker,	do	309
"	Genoa,	do	197
"	Lark,	Cleveland,	367
"	Harvest,	do	306
"	R. H. Harmon,	do	343
"	Mary and Lucy,	do	91
"	M. Ballard,	do	288
"	Cuyanoga,	do	322
"	Gertrude,	do	369
"	D. B. Sexton,	do	345
"	W. H. Stevens,	do	297
"	Yorktown,	do	371
"	Wm. Case,	do	378
"	Augustus Handy,	do	342
"	Kate Richmond,	do	328
"	Ellen Williams,	do	390
"	W. G. Grant,	do	340
"	J. F. Warner,	do	342
Schooner	David Todd,	Cleveland,	373
"	W. S. Nelson,	do	378
"	Wild Rover,	Milan,	290
"	Darien,	do	298
"	Sebastopol,	do	295
"	J. P. Kirtland,	do	312
"	E. St. J. Bemis,	do	294
"	Lucy J. Latham,	do	299
"	Uncle Tom,	do	296
"	Live Oak,	Huron,	219
"	Clifton,	do	165
"	Bonny Doon,	do	288
"	Ketchum,	do	268
"	Africa,	Vermillion,	254
"	Wellington,	do	298
"	R. J. Gibbs,	do	170
"	A. Medbury,	do	226
"	Queen City,	do	378
"	Drake,	Black River,	350
"	Lemuel Crawford,	do	461
"	L. A Newman,	do	350
"	Matt Root,	Fairport,	387
"	G. J. Morton,	Erie,	100
"	New Lisbon,	Ashtabula,	236
"	C. E. Bailey,	Madison Dock,	121
"	Neptune,	Ashtabula,	112
"	Sea Star,	Irving,	120
"	L. B. Goldsmith,	Toledo,	200
"	Torrent,	Newport,	411
"	Col. Cook,	do	327
"	Reciprocity,	Detroit,	315
"	Charles Sumner,	do	250
"	Caledonia,	do	82
"	Quickstep,	Saginaw,	270
"	J. M. Jones,	Milwaukee,	156
"	North Cape,	do	107
"	Indus	do	246
"	Fanny and Floy,	do	143
"	Adda,	do	273
"	Odin,	do	173
"	Undine,	do	100
"	May Queen,	do	246
"	E. C L.,	Chicago,	360
"	J. W. Sargent,	Racine,	147
"	J. S. Harvey,	Sheboygan,	298
"	Forfar,	Chicago,	170
"	North Star,	Manitowoc,	209
"	Anna Thorin,	do	92
"	Enterprise,	Michigan City,	134
"	E. K. Gilbert,	St. Clair,	101
"	Caledonia,	St. Joseph,	130
"	Experiment,	do	51
"	Zadock Pratt,	Rowan,	370
"	Ellen Pike,	New Buffalo,	63
"	Hirondella,	Cape Vincent,	90
"	T. Y. Avery,	Oswego,	350
"	Persian,	do	345
"	Amelia,	Clayton,	342
"	Onward,	Sacketts Harbor,	342
"	Cornwall,	Sodus,	148
"	Geo. Steele,	Three Mile Bay,	350
"	Oliver Culver,	Charlotte,	392
"	Crusader,	do	61
"	Margaret,	Holland,	108
Total tons			31,270
Total sail value		$1,213,300	

	No.	*Tonnage.*	*Value.*
Steam	15	6,159	$395,000
Sail	113	21,270	1,213,300
Total	128	37,429	$1,608,300

The above list comprises three steamers, eight propellers, four tugs, two barques, six brigs, and one hundred and five schooners; making a total of *one hundred and twenty-eight* vessels.

The following table will show the rig, names, tonnage and value of Canadian vessels built on the lakes, with the ports at which they were built, during the year 1855:

Rig.	*Name.*	*Where built.*	*Tons.*	*Rig.*	*Name.*	*Where built.*	*Tons.*
Steamer	Bowmanville,	Hatters Bay,	250	Schooner	Eliza Wilson,	Port Nelson,	70
"	Banshee,	do	300	"	Acorn,	Port Hope,	65
"	Europa,	Hamilton,	450	"	Allies,	Oshawa,	310
Propeller	Maria,	Belleville,	200	"	Ayr,	Port Dalhousie,	300
				"	B. F. Davy,	Bath,	360
Total steam tons			1,200	"	W. H. Merrit,	St. Catharine's,	320
Total value		$150,000		"	J. P. Mack,	Port Burwell,	370
Barque	T. F. Parks,	Amherstburgh,	370	"	Jesse,	St. Catharine's,	350
"	Reindeer,	Georgian Bay,	400	"	Belle,	Oakville,	32
Brig	Alice Grover,	Colborne,	200	"	Alma,	Sarnia,	78
"	Peerless,	Bronte,	120				
"	Alma,	Kingston,	250	Total sail tons			4,448
Schooner	Wm. Raynor,	Port Nelson,	156	Total value		$181,600	
"	Two Brothers,	Oakville,	150		*No.*	*Tonnage.*	*Value.*
"	Theresa,	St. Catharine's,	250	Steam	4	1,200	$150,000
"	Perseverence,	Niagara,	120	Sail	22	4,448	181,600
"	Geo. Henry,	Port Nelson,	30				
"	Eliza Maria,	Presque Isle,	47	Total	26	5,648	$331,600
"	Marshall Emblem,	Port Hope,	100				

The following will show the names, rig, tonnage, and value of vessels built on the Canadian shores of the lakes, with the port at which they were built, during the year 1856:

Rig.	*Name.*	*Where built.*	*Tons.*	*Rig.*	*Name.*	*Where built.*	*Tons*
Steamer	King of Algiers	Toronto,	500	Schooner	Anna Maud,	Port Hope,	60
"	R. Howard,	Dunnville,	64	"	Linne Powell,	Dover,	244
Propeller	Inkermann,	Kingston,	300	"	Catharine,	Amherst Isle,	90
"	Tinto,	Sorel,	400	"	Louisa,	St. Catharine's,	272
"	Whitney,	Montreal,	156	"	Sir Wm. Head,	do	272
				"	Wm Wallace,	Goderich,	50
Total steam tons			1,420	"	Challenge,	Collingwood,	200
Total value		$87,000					
Brig	Baltimore,	Kingston,	300	Total sail tons			2,498
Schooner	Sardinia,	Coldwater,	140	Total value		$109,000	
"	J. G. Beard,	Oakville.	180		*No.*	*Tonnage.*	*Value.*
"	Alliance,	do	180	Steam	5	1,420	$87,000
"	Canadian,	do	140	Sail	15	2,498	109,000
"	Ida,	St. Catharine's,	30				
"	Hamilton,	South Bay,	150	Total	20	3,918	$196,000
"	Elk,	Port Robinson,	190				

The Toronto *Globe* of a recent date publishes a list of the Canadian steamers and schooners trading on the lakes, with the names of masters, rig, tonnage, owners, when and where built, and value. The list foots up—48 steamers, 17 propellers, and 169 schooners; the tonnage of which amounts to about 41,196 tons, and the value of which is about $3,494,000. In addition there are 9 vessels in course of construction, amounting to 2,500 tons, and 34 small craft engaged in the wood and stone coasting trade.

FAST SAILING.—The clipper ship Mandarin sailed from New-York to Melbourne in 70 sailing days, the shortest run on record.

WIND AGAINST STEAM.

At our request the owner of the ship Dreadnought, David Ogden, Esq., has furnished us with the following abstract of her performance, the log having been mislaid. This vessel was designed for the Liverpool trade. Her lines have been already published in the 2d vol. of the Magazine. She has a capacity of 14,000 barrels.

Nov. 20th, 1854, at 6.30, passed Sandy Hook; passed Cape Clear in 12 days, 12 hours; was off Point Lynas at 10 A. M., on the 4th of Dec., and safe in dock that evening, making 13 days, 11 hours, allowing for the difference of time running to the eastward. Her log for 1856 is as follows:

January 25th. W. N. W.........345 miles.
26th. W. N. W............312 miles.
27th. N....................252 miles.
28th. N. N. W............223 miles.
29th. Violent gale, drifted 90 miles to W. S. W.
30th. E. to N. moderate....115 miles.
31st. Heavy squalls........212 miles.
February 1st. N. W..............228 miles.
2d. N. N. W............208 miles.
3d. W. N. W............185 miles.
4th. S. W.................238 miles.
5th. S. W.................252 miles.
6th. W....................244 miles.
7th. S. W. to S. S. E......212 miles.
8th. Off Point Lynas. Hove-to until daylight for pilot and tide.

Total distance run, 3,116 miles in 14 days, or an average of 222 miles per day.

Sailed from New-York 4th of May last, arrived in Liverpool 20th of May, in 15½ days.

Left New-York Jan. 24th, arrived back March 23d; absent from New-York, 59 days. Left New-York May 4th, arrived back July 13th; absent from New-York, 70 days. Left New-York again Aug. 15th, having sailed from New-York three times in 203 days.

REGATTA OF THE NEW-YORK YACHT CLUB.

The late regatta of August 8th, has been very generally regarded as the most interesting one that has ever taken place in the United States. The committee have been unable to furnish the correct data in time for the present issue; as a consequence we shall only announce the names of the contestants, with the victors, reserving a more complete statement for our next issue.

First class, carrying 3,300 square feet of canvas and upwards, allowance of time one second per square foot.

Favorita	Schooner	130 tons.
Haze	do.	105 "
Julia	Sloop	83 "
Twilight	Schooner	71 "
Widgeon	do.	101 "

Prize won by Julia, owned by J. M. Waterbury, Esq.

Second class, carrying 2,300 square feet of canvas and upwards, but less than 3,300, allowance of time, 1½ seconds per square foot.

Una	Sloop	67.5 tons.
America	Schooner	69.5 "
Sea-Drift	do.	63.6 "

Prize won by America, owned by R. F. Loper, Esq.

Third class, carrying less than 2,300 square feet of canvas, allowance of time 1½ seconds per square foot.

Ray	Sloop	30 tons.
Richmond	do.	27 "
L'Esperance	do.	23 "
Mystic	do.	— "

Prize won by Richmond, owned by C. H. Mallory, Esq.

DISASTERS AT SEA.

STEAMERS.

Cauco, Wilmington, Del., for Santa Martha, put into Charleston (much damaged), July 24th.
Red Jacket, (tug) sunk off Chincoteague, July 24th (crew saved).
St. Johns, was burned at Jacksonville, Fla., July 21st.
Zebra, Havre, for Liverpool, stranded on Lizard Point, July 22d (sup. total loss).
Daniel C. Taylor, sunk in the Missouri River, August 9th (sup. total loss).
Brunswick (propeller), Chicago, Ill., for Buffalo, N. Y., foundered in Lake Michigan, Aug. 11th.

SHIPS.

Geo. A. Hopley, Liverpool, for Charleston, S. C., went ashore near Portrush, July 7th, is a total loss.
Eli Whitney, Liverpool, for Boston, was seen, June 20th, in distress.
Benj. Thaxter, Cardiff, for New-York, was abandoned in a sinking condition, July 30th.
Unknown, was seen on fire, July 14th, near the Bimina Islands.
Avondale, at Baltimore, from Liverpool, lost sails, rigging, &c., June 19th.
Medora, Quebec, for Dublin, was totally lost near St. Pierre, Miq., July 25th.
Young America, at San Francisco, lost sails, &c.
Lotus, at San Francisco, lost sails, &c.
Vesper, Liverpool, for New-York, foundered at sea, July 18th (crew saved).

BARQUES.

J. C. Hand, Philadelphia, for New-Orleans, was wrecked near the Bahamas, July 16th.
W. P. Moore, went ashore near Cape Henry, July 13th (sup. total loss).
Brothers (Br.), Quebec, for ———, was wrecked off Prince Edwards Island, July 30th.
Venus, at New-York, from Curacoa, lost main-top-gallant-masts, July 19th.
Claremont (Br.), Boston, for St. Stephens, N. B., went ashore at the mouth of Machias River, Aug. 9th.
Florence (Br.), Glasgow, for Windsor, N. S., went ashore at the mouth of the Machias River, Me., Aug. 8th (sup. total loss).
Adieu (Br.), Glasgow, for Boston, went ashore near Cape Ann, Aug. 13th (very leaky).

BRIGS.

Isis, St. Johns, N. B., for Philadelphia, was run into, July 20th, by ship Weymouth, and put into Newcastle, Me., in distress.
Gen. Foster, at Aux Cayes, was capsized in a squall, July 5th, and was condemned.
Royal Sailor, Cardenas, for Boston, put into Key West, Fla., in distress, July 21st.
Dido, Jacksonville, for Boston, put into New-York, leaky, July 26th.
Red Warrior, Marseilles, for New-York, was burned at sea, July 13th (crew saved).
Eclipse, at New-York, from Bahia, split sails, &c., July 30th.
Frank, Mobile for Havana, was wrecked near Bahia Honda, July 23d.

Aonian, Jacksonville, Fla., for Cienfuegos, was lost near Inagua, July 6th.
James Wallace, Pictou, N. S., for Fall River, Mass., put into Salem, Mass., leaky, August 11th.
P. M. Tinker, Baltimore, Md., for Boston, got ashore on "Bearse" Shoal, Aug. 10th, (much damaged.
Desco (Mex.), Campeachy, for Liverpool, put into Charleston, S. C., leaky, Aug. 14th.

SCHOONERS.

Louisa, at Wilmington, N. C., from Boston, lost main-mast, &c., July 16th.
Byzantium, from Virginia, put into Newport, Rhode Island, in distress, July —.
Calvin Stephens, Baltimore, for Corpus Christi, was wrecked in Aransas Pass, July 5th
Congress, was totally lost on Green Island, July 21st.
G. B. Mathews (Br.), New-Orleans, for Balize, was wrecked off Gorf Keys, July 8th.
Island City, Baltimore, put into New-York, dismasted, &c., Aug. 10th.
Velocity, New-York, for Eastport, Me., was wrecked near Machias, Me., Aug. —.

LAUNCHES.

At Castine, Me., July 23d, ship H. Williams, of 1,000 tons.
At Biddeford, Me., Aug. 2d, by E. Perkins, Esq,, ship H. B. Mildmay, of 856 tons.
At Bath, Me., Aug. 12th, by Messrs. Arnold & Co., ship ———, of 675 tons.
At Columbia, Me., Aug. 6th, by J. Carleton, Esq , schr. J. W. Drisko, of 291 tons.
At Duxbury, July 19th, barque A. Carney, of 320 tons.
At Essex, Mass., July 19th, barque Lombard, of 250 tons.
At Greenpoint, L. I., Aug. 2d, by E. F. Williams, Esq., barque Lexington, of 400 tons.
At Sullivan, Me., July 26th, barque Valetta, of 460 tons.
At New-York, July 31st, by A. C. Bell, Esq., barque Rosetta, of 575 tons.
At Newburg, N. Y., July 30th, by T. S. Marvel, Esq,, barque Glimpse, of 500 tons.
At Port Jefferson, L. I., July 30th, by J. M. Bales, Esq., barque M. E. Jones, of 300 tons.
At Belleville, N. J., July 23d, by C. O. Jeroleman, Esq , schr. Langdon Gilmore, of 510 tons.
At Machias, Me., Aug. 5th, by Messrs. N. & S. Longfellow, schr. John Shaw, of 120 tons.
At Machias, Me., Aug. 5th, by Messrs. N. & S. Longfellow, schr. Hiawatha, of 150 tons.
At Baltimore, Aug. 13th, barque A. E. Grant, of 350 tons.
At Key West, Fla., Aug. 14th, by Messrs. Bowne & Curry, ship S. R. Mallory, of —— tons.
At Liverpool, N. S., Aug. 5th, by G. S. Parker, brig Abeona, of 155 tons.
At New-Bedford, Mass., Aug. 2d, by Messrs. Andrews & Co , barque Kingfisher, of 450 tons.
At Baltimore, July 30th, by Messrs. Abraham & Sons, schr. Crenshaw, of 375 tons.
At Baltimore, Aug. 16th, by John A. Robb, Esq., barque Carlotta, of 590 tons.
At Mattapoisett, Aug. 16th, by J. Holmes, Esq., ship Sea Ranger, of 370 tous.

SALES OF VESSELS.

Ship Shanghae, of Bowdoinham, Me., for $31,000.
Ship Audubon, 531 tons, at auction in Boston, Aug. 13th, for $16,000.
Ship Morea, of New-Bedford, 330 tons, for $8,000.
One-fourth of ship J. Wakefield, 1,268 tons, at auction, Aug. 15th, for $9,100.
One-eighth of ship Condor, at auction in New-Bedford, July 30th, at the rate of $6,600.
One-thirty-second of ship Condor, at auction in New-Bedford, July 30th, at the rate of $6,400.
One-eighth of ship N. B. Palmer, 1,450 tons, at auction in New-York, July 22d, for $5,000.
One-eighth of ship Mercury, 1,300 tons, at auction in New-York, July 22d, for $5,856.
One-eighth of ship Golden State, 1,303 tons, at auction in New-York, July 22d, $5,300.
One-eighth of ship Kathay, 1,500 tons, at auction in New-York, July 22d, $7,500.
One-eighth of ship Hornet, 1,427 tons, at auction in New-York, July 22d, $4,750.
One-eighth of ship M. Evans, 899 tons, at auction in New-York, July 22d, $3,650.
One-eighth of ship American Eagle, 896 tons, at auction in New-York, July 22d, $3,650.
One-eighth of ship Victoria, 870 tons, at auction in New-York, July 22d, $2,600.
One-ninth of ship Northumberland, 895 tons, at auction in New-York, July 22d, $2,000.
One-sixth of ship Underwriter, 1,162 tons, at auction in New-York, July 22d, $6,600.
One-sixteenth of ship Calhoun, 1,173 tons, at auction in New-York, July 22d, $4,356.

One-sixteenth of ship F. P. Sage, 1,050 tons, at auction in New-York, July 22d, $3,100.
One-sixteenth of ship Robert Kelly, 1,200 tons, at auction in New-York, July 22d, $3,400.
One-sixteenth of ship Tahmiroo, of Fairhaven, at auction, Aug. 2d, at the rate of $5,700.
One-sixteenth of ship Tahmiroo, of Fairhaven, at auction, Aug. 2d, at the rate of $5,615.
Ship Fanny Forrester, 624 tons, 6 years old, for $24,000.
Barque Tangier, 394 tons, at auction in Boston, for $10,000.
Barque Fenelon, 393 tons, 9 years old, for $18,000.
Barque Gem, 350 tons, 4 years old, at auction in Newport, R. I., Aug. 15th, for $480.
Brig J. Marston, 110 tons, at Baltimore, July 22d, for $4,500.
Brig Moselle, built at Bucksport, Me., 10 years old, for $3,300.
Brig H. N. Hutchins (Br.), 155 tons, 3 years old, at auction in New-York, Aug. 7th, for $900.
Schooner Henry, 126 tons, 16 years old, for $2,000.

NOTICE TO MARINERS.

The Court of Directors of the East India Company have lately received from the Government of Bengal, the following notification, which is published for general information :

Sailing Instructions for Entering the River Mutlah from Sea.—The channels leading from sea into the river Mutlah having been buoyed off, the following notice is published for general information :

The Western (or Ward's) channel is bounded on the west by the Balchery Reef, or Sand, extending southwardly from the island of that name, and on the east by the Roymutlah Sand, part of which dries at low water. This channel is from 2 to 5 miles wide, and is marked off by six buoys—four red, or western, and two black, or eastern.

The outermost, or Reef buoy, is a first-class spire buoy, with two baskets on it; it is painted red, and marked with the letter M; it lies in 4½ fathoms low water, spring tides; latitude 21° 11' N., longitude 88 deg. 42 min. 45 sec. E., and bears from the Eastern Channel Floating Light buoy E. by N. ½ N., distant 32 miles.

The centre Balchery buoy is a second-class spire buoy, with one basket on it; it is painted red, and marked Mutlah in full; it lies in 4 fathoms low water, about 7 miles N. N. W. from the outer, or Reef buoy.

The Balchery Spit buoy is also a spire buoy, painted red; it lies in 4 fathoms low water, on a spit of the sand, about 9 miles N. ½ W. of the centre buoy.

The upper Balchery buoy is also a spire buoy, painted red; it lies in ¼ less 4 fathoms, about 6 miles N. by W. from the Spit buoy, and W. by S. ¾ S. of the flag-staff on Dalhousie point.

The outer easternmost buoy of this channel is a second-class spire buoy, painted black with one basket on it; it lies in 4¼ fathoms low water, on the S. W. verge of the Roymutlah Sand, N. E. by N. of the Reef buoy, distant 5½ miles.

The Roymutlah Western Spit buoy is a second-class spire buoy, painted black; it lies in 4 fathoms low water, N. W. ½ N. from the outer black buoy, distant about 10 miles, and north about 6 miles from the centre Balchery buoy.

The mid-channel course from sea to abreast of the above Spit buoy is N. N. W. ½ W. 15 miles. From that point north 15 miles will carry a vessel up to Halliday's island.

The Eastern, or Roymutlah channel, is bounded by the Roymutlah Sand to the westward, and the Bangadoonee Sand, or Reef, to the eastward, and is marked off with four buoys—three red, or western, one black, or eastern.

The outermost buoy is a second-class spire buoy, with one basket upon it; it is painted red, marked $\overset{R}{\text{MUTLAH}}$; it lies in 5 fathoms, low water, on the S. E. verge of the Roymutlah Sand, N. E. by E., about 10 miles from the Balcherry Reef buoy.

The Roymutlah Eastern Spit buoy is painted red; it lies in 5 fathoms low water, N. N. W. ½ W., about 6 miles from the outer buoy.

The upper Roymutlah buoy is painted red; it lies in 4¾ fathoms low water, N. W. of the Spit buoy, distant about 5½ miles.

The innermost buoy of this channel is painted black; it lies in 5 fathoms low water, on the south verge of a flat extending from Dalhousie point to the S. S. E.; it bears from the upper Roymutlah buoy N. by W., distant about 4 miles.

The mid-channel course in the Roymutlah channel is N. W. ½ N. to the blaek buoy, and from that point N. N. W. to N. by W. to Halliday's island.

Vessels resorting to the river Mutlah during the S. W. monsoon should adopt a similar route, and conform to the directions for making the Pilot Station at the entrance to the river Hooghly, taking their departure from the Eastern Channel floating light, steering E. by N. ½ N. to cross the tail of the eastern prong of Saugor Sand in 5 fathoms, off which they would deepen into 7 fathoms, shoaling again on the Light-house Sand to 5½ or 6 fathoms, deepening off into 6½ or 7, and crossing the Balchery reef in 4½ to 5 fathoms a little south of the Reef buoy:

Commanders of vessels doubtful about crossing the tails of Sands in a heavy swell could steer more to the southward, and keep in 8 or 9 fathoms, soft ground; but great care would be requisite not to overrun the distance.

During the N. E. monsoon, commanders of vessels confident of the correctness of their reckoning should work up direct for the Balchery Reef buoy; but during cloudy or thick weather, crossing the Swatch of No Ground in about the latitude of the buoy, and running down upon it, would be advisable.

It is high water full and change, about 9 hours 15 minutes; at the Balchery Reef buoy, the tides set round, as in the channels to the Hooghly; the floods making to the west, the ebbs to the eastward, having a velocity during the springs from 2½ to 3 miles per hour, and a rise of 9 feet.

The bottom throughout the channels is mud, the sands exceedingly hard, and the lead an excellent and safe guide towards them. The least water in the Western or Ward's channel is 4 fathoms; in the Roymutlah 5 fathoms, low water springs.

From Halliday's island the course continues north up to the "Cattalee," where the river takes a sharp turn to the westward and the channel contracts. Up to this point a stranger, with Ward's chart, and ordinary care, could, without a pilot, conduct his ship with safety, attending to the set of the tides, leaving the red buoys to the westward and black buoys east of his course.

Fort William, *Marine Superintendent's Office, March* 8, 1856.

Calibogue Sound Light-Vessel.—A light-vessel has been moored in Calibogue sound, (in 4¼ fathoms water at low tide,) between Grenadier shoals and the Eastern Breakers, running off the southeastern point of Hilton Head. She is schooner-rigged with a third mast for the lantern; hull painted red, and will show one bright white light at an elevation of 30 feet above the sea.

Tybe light bears	S. ¾ W.
Tybe beacon bears	S.
Braddock's Point bears	N. by E.
Southeast point of Hilton Head bears	E. N. E.

The light will be shown for the first time on the evening of August 1st. Bearings and courses are magnetic.

Charleston, S. C., July 22, 1856.

St. Croix Light-house, Maine.—A light-house will be built during the present season on Big Island, in the St. Croix River, otherwise called Neutral Island and St. Croix Island. The structure will be built of wood, and the tower will be on the top of the keeper's house. The color will be white.

The light shown will be fixed, of the natural color, and the illuminating apparatus will be a Fresnel lens of the fifth order.

The centre of the light will be about 40 feet above the level of high water, and the light will be seen in good weather about 11 nautical miles.

Notice, giving the latitude and longitude, will be published before the light is placed in operation.

The light-house will be lighted for the first time on the night of Monday, the 2d day of February, 1857, and will be kept burning during every night thereafter.

Portland, Me., July 17, 1856.

Gay Head Light-house—Martha's Vineyard Sound.—A new light-house has been erected on Gay Head, entrance of Martha's Vineyard Sound. The tower is built of brick, and is thirty-five feet high. The keeper's houses are of brick also, and the centre of the tower is twelve feet in front of the centre of the houses. The color is the natural color of the brick.

The focal plane of the light is one hundred and ninety-one feet above the level of the sea; and the distance at which it will be visible from the deck of a vessel, fifteen feet above the level of the sea, is at least twenty nautical miles.

The illuminating apparatus is a revolving Fresnel lens of the first order, showing a bright flash every ten seconds.

This light will be exhibited for the first time at sundown, December 1, 1856, from which date the revolving light shown at Gay Head at present will be discontinued.

Washington, D. C., July 22, 1856.

Official information has been received at the Office of the Light-house Board, that at different places on the western coast of North Jutland, and on the isle of Bornholm, (Denmark,) salvage stations for the saving of lives from shipwreck, are established, furnished with all necessary apparatus for the purpose, such as life-boats and rocket apparatus for carrying a line.

The stations are as follows, viz.:

I.—ON THE WESTERN COAST OF NORTH JUTLAND.

Skagen,	furnished with	life-boat and	rocket-apparatus	for carrying	a line.
Kandestederne	"	"	"	"	
Hirtshals	"	"	"	"	
Lönstrup	"	"	"	"	
Lökken	"	"	"	"	
Blokhusene	"	"	"	"	
Sletth Strand	"	"	"	"	
Lild Strand	"	"	"	"	
Hanstedholm	"	"	"	"	
Klitmöller	"	rocket-apparatus for carrying a line.			
Nodre-Vorupöre	"	life-boat and rocket-apparatus for carrying a line.			
Vester-Agger	"	rocket-apparatus for carrying a line.			
Agger Kanal	"	life-boat.			
Thybo-Rön	"	rocket-apparatus for carrying a line.			
Flyvholm	"	life-boat and rocket-apparatus for carrying a line.			
Tuskiær	"	"	"	"	
Vædersö-Klit	"	"	"	"	
Sönder-Lyngvig	"	"	"	"	
Bierregaard	"	rocket-apparatus for carrying a line.			
Henestrand	"	"	"	"	
Blaavandshuk	"	life-boat and rocket-apparatus for carrying a line.			

II.—ON THE ISLAND OF BORNHOLM.

Rönne,	furnished with	rocket-apparatus	for carrying a line.	
Allinge	"	"	"	
Gudheim	"	"	"	
Svanike	"	"	"	
Snogebak	"	life-boat and rocket-apparatus for carrying a line.		

"If communication with a stranded vessel in no other way can be effected, a 9-yarn line will be thrown at the ship-wrecked men by aid of a rocket-apparatus; hauling on board this line, a 3½-inch hawser will follow, at the end of which a block is made fast, in which is the bight of a thin line. Both ends of this line are fast on the life-chair, that with its thimble traverses on the 3½-inch hawser. The hawser must be made fast on board the ship as high as possible, in order that the chair, if possible, may clear the surf. By the aid of the thin line that passes through the block made fast on the hawser on board, the chair can be hauled to and fro, from the beach, and thus the communication for the saving of the shipwrecked is effected."

Washington, July 25, 1856.

Red Light at the Narrows, Boston Harbor.—A fixed red light was exhibited on the night of August 1, 1856, (in conformity to previous notice,) from the screw pile light-house erected on the spit abreast the Narrows, Boston Harbor.

The house is a hexagonal building, painted a dark brown color; is elevated on seven iron piles, and surmounted with an iron lantern.

The light is designed as a guide for clearing the spit, by vessels passing through the main ship channel, and is illuminated by a lens apparatus of the 6th order, elevated 35 feet above high-water mark.

This light in range with Long Island Head light will take a vessel clear off the Harding's.

From Point Alderton buoy, this light is in range with Long Island Head light, and they bear W. N. W. ¼ W. This range will take a vessel by the buoy, in 19 feet water at low tide. Large vessels, in entering, should bring Long Island Head light open to the northward of the Spit light.

The following magnetic bearings are given from this light:

False Spit buoy, E. S. E. ¼ E. Point Alderton buoy, E. S. E. ¼ E. North Centurion buoy, S. E. ¾ S. Long Island Head light, W. N. W. ¼ W. Mix's Mate beacon, N. W. ½ W.

By order of the Light-house Board.

Boston, August 1, 1856.

Fog Bells on Mount Desert and Matinicus Rocks, Coast of Maine.—A fog bell weighing 1,500 pounds has been placed on Mount Desert rock, near the light-house. The bell is placed on an open frame structure, painted white and brown, and is about 50 feet above the level of the sea. It is worked by machinery, and strikes about seven times in one minute.

A bell of the same weight has been placed on Matinicus rock, on a frame precisely like that of the Mount Desert rock bell. This bell strikes ten times in one minute.

Both of these bells will be sounded hereafter in thick weather.

By order of the Light-house Board.

Portland, Me., August 5, 1856.

Light-House on Chandeleur Island, Coast of Louisiana.—The new light-house on the Chandeleur Island has been completed and will be lighted on the 15th instant.

It is situated at the north end of the island, near the site of the former light-house, and will show a fixed white light by means of a 4th order lens.

The tower is white and fifty feet high.

The light should be visible from a common deck at a distance of 13 nautical miles.

A safe anchorage in 4 fathoms can be had during easterly storms, under the lee of this light, by hugging the east and north shore of the island, in that depth of water, around westerly and southerly till the light is brought to bear N. E., about two miles distant.

The Ship Island light can be seen from this anchorage, bearing from the Chandeleur Island light nearly N. W. (magnetic) 17 miles distant.

By order of the Light-house Board.

Mobile, Ala., August 5, 1856.

Buoy on Cross Ledge Shoal, Delaware Bay.—A third class nun buoy, painted red, has been placed in seven feet water, to indicate the foundation of the light-house upon this shoal.

The foundation bears N. N. E., distant 15 yards.

The Ledge light-vessel bears S. S. W.

The Ledge buoy bears S. by W. ½ W., distant ¾ mile.

By order of the Light-house Board.

Philadelphia, Pa., August 8, 1856.

Mediterranean Sea.—Official information has been received at the Office of the Light-House Board, that the Turkish government has given notice that the following lights, situate respectively in the Dardanelles, Bosphorus, and Black Sea, were relighted on the 1st June, 1856 :

Gallipoli—Dardanelles.—A fixed white light has been temporarily placed on the tower nearest to the town of Gallipoli, on the European shore of the Dardanelles, at a height of 98 feet above the level of the sea, and should be visible from the deck of a ship at 10 miles distance, in clear weather.

This light will shortly be replaced by a revolving light of the second order.

Fanar Bakcheh—Skutari.—A fixed white light has been established on the point Fanar Bakcheh, on the coast of Asia, three miles and a half to the southward of the town of Skutari, at a height of 84 feet above the level of the sea, and should be visible at a distance of 10 miles.

Anadoli Light—Bosphorus.—A revolving light has been established on the ancient tower of Anatolia, on the Asiatic shore, at the entrance from the Bosphorus into the Black Sea.

The light shows, alternately, a red face followed by two white faces, or flashes at intervals of two minutes each; the light gradually increasing and decreasing, but never totally eclipsed. It stands at a height of 250 feet above the level of the sea, and may be seen at a distance of 18 miles in clear weather.

The illuminating apparatus is a catadioptric lens of the third order.

Rumili Light—Bosphorus.—A fixed white light has been established on the ancient tower of Roumelia, on the European shore, at the entrance from the Bosphorus into the Black Sea.

It stands at an elevation of 190 feet above the level of the sea, and should be visible at a distance of 18 miles in clear weather.

The illuminating apparatus is a catadioptric lens of the third order.

Fidonisi Light—Black Sea.—A fixed light has been temporarily placed on Fidonisi, or Serpent island, in the Black Sea, off the coast of Bulgaria, at 24 miles E. ½ N. of the Sulina entrance of the Danube.

The light-house is of wood, painted white, 70 feet high, and stands on the summit of the island, in lat. 45 deg. 15 min. 36 sec. N., long. 30 deg. 14 min. 54 sec. east of Greenwich.

The light is shown at an elevation of 195 feet above the level of the sea, but at present has a range of only 10 miles; it is visible through an arc of the horizon of 200 deg., or from west (magnetic) round southerly to E. N. E.

This temporary light will shortly be replaced by a revolving light of the second class.

Treasury Department, *August* 9, 1856.

The Crozets.—We have received the following communication from Mr. Sims, master of the barque Fairy Queen, now in our port:—Having seen, both in the papers of England and in this colony, letters regarding the uncertain position of those dangerous islands, the Crozets, and being in one of the ships two years since (the Athelstan) that saw them when we fancied we ought not, and had an opportunity of ascertaining their position, I beg leave to forward my opinion regarding them. Coming from England this time in the Fairy Queen I saw them, and had an excellent opportunity of ascertaining their position, the weather being very fine, which is a very rare occurrence in those latitudes, the islands generally, even in fine weather, being enveloped in a dense fog. The position that I found the northernmost, or Hog Island, to be in is 46 10 of south latitude, and 50 10 of east longitude, which is 18 miles north and 25 miles west of the position given them on the new charts.—*S. A. Register.*

Alterations in the Position and Bearings of the Buoys at the Entrance of the Surinam River.—The outer buoy being drifted to the westward has been replaced in the former position, and can be passed to lee or to windward.

The second, which has been long missed, is also replaced, but somewhat more to the eastward in the same depth.

Vessels of some draft of water are warned not to pass on the east side of the three innermost buoys, the depth diminishing here very quickly, but to keep the buoys all on their port side in entering the river, and steer with the same course (S. by E.) along the three first buoys.

Taking the easterly hook or point of the river where a beacon is erected for Bramspoint, the buoys lie in the following bearings (true) and depths at low water of spring tides:

The outer buoy in 3½ fathoms mud; bearing—Bramspoint, S. S. E. ½ E., the second buoy S. E. by E.; the easternmost land E. ¾ S.

The second buoy in 3 fathoms mud; bearing—Bramspoint, S. E. by S.; third buoy S. by E.; easternmost land E. ½ N.

The third buoy is 3 fathoms hard ground; bearing—Bramspoint, S. E. ½ E.; fourth buoy, S. S. E. ½ E.; easternmost and E. by N.

The fourth buoy is 3 fathoms hard, shelly ground; bearing—Bramspoint S. E. by E. ½ E.; easternmost land, E by N.

Between the second and third buoys, the ground very soon becomes solid and hard.

It may be observed that the bearings on the easternmost land do not merit much credit, because the different state of the weather makes a great difference in the appearance of this low coast.

By order of the Light-house Board.

Beacons and Buoys at Galveston, Texas.—The Galveston Gazette gives the following as the order in which beacons and buoys are passed by vessels entering the harbor of Galveston from sea, as described by Lieut. Stevens, United States Light-house Inspector of Texas:

Outer buoy—iron nun—black and white perpendicular stripes—Catholic church (two towers) bears W. by S.; north breaker, or inner buoy, bears N. W. by N.; light-ship bears N. W. ½ N.; light-house N. W. Water, 14 feet. To cross the bar, make this buoy and run for the inner one; after passing the inner buoy, bring the light-ship and light-house in range and run for them, passing the light-ship on either side.

Inner (iron nun) buoy—black and white perpendicular stripes—light-ship bears N. W.; light-house N. W. ½ W.

Knoll buoy, black, iron nun, light ship bears E. by N.; light bears N. W.; Catholic church, S. S. W.

Pelican Spit, red, iron can buoy—light-ship bears E. by N. This buoy to be left on the starboard hand; leaving it on the port side carries you into Bolivar channel. These last buoys are on a range with the light-ship. After passing buoy No. 3, steering W. S. W. till the end of the sand spit on the N. E. end of Galveston Island is in range with the Catholic church; then running for the point will carry you down the channel to town.

Stake on spit opposite the north-east end of the island of Galveston.

Post with a pointer towards the channel.

On starboard hand of the channel, reef bare at very low tides.

These buoys are changed as the channel shifts, so that the bearings, as given above, may not always apply; the variations would not generally exceed a point.

A beacon is building on the north breaker; it will be a little inside the outer buoy. The light-house will bear from it about N. W. It will be black and in ten feet water on the east side of the channel.

By order of the Light-house Board.

Description of the Position of the Buoys and Beacon in the Nickerie outer Channel.—The outer buoy is lying in the depth of 11 feet at low water; bearing—Landdrost's house E. S. E. ½ E.; (true) flagstaff of the post, S. E. by E. ½ E.; easterly land, E. N. E. ½ E.

The inner buoy at the same depth; bearing—Landdrost's house, E.; flagstaff E. S. E.; outer buoy N. by W. ½ W.

The beacon stands in three feet at low water; bearing—flagstaff E. by S.; outer buoy, N. ½ W.; Landdrost's house, E. N. E.

Vessels are to pass on the west and close to the buoy; by approaching the inner buoy they must luff up immediately, the channel then being open, and can steer by the course S. E. by E., till before pier at Rotterdam; moreover, to show the course of the windward and lee banks in the mouth of the Nickerie creek, several small piles of sticks are placed along their edge.

By order of the Light-house Board.

The 2d class iron Nun Buoy, painted red and black horizontal stripes, placed this spring to mark the west end of the Long Sand Shoal, Long Island Sound, has been dragged from its position by a vessel making fast to it, to save the labor of anchoring. It will be replaced at the earliest day possible.

July 3, 1856.

QUARANTINE GROUND, NORFOLK, VA.—The board of health have caused to be erected on the bank of the river, (starboard side in coming up,) two miles below Fort Norfolk, a flag staff intended to designate the limit of the quarantine ground. It is on an elevated ground, and its height is 51 feet. It is surmounted by a yellow ball; ten feet of it from the top is painted yellow, and a yellow flag will be displayed from it during the period of quarantine. An object so conspicuous cannot fail to be seen from all vessels coming up, as soon as they pass the Craney Island light; and those from ports within quarantine interdiction will come to anchor below it.

PLUM ISLAND LIGHT, NEWBURYPORT.—The eastern tower on Plum Island, Newburyport harbor, was struck by lightning on the evening of the 8th inst., and entirely consumed, with its contents. The bug light at this station will be placed in range with the western tower, and illuminated as soon as possible.

By order of the Light-house Board.

Boston, August 11, 1856.

UNKNOWN ISLANDS.—Captain West, of the ship Sirocco, at San Francisco from Hong Kong, makes the following report: May 20, at 12 M. was six miles south of an island of oval shape, ten miles in length N. N. W. and S. S. E.; at 1 P. M. saw another island N. E. and S. W. 12 miles long, and 3 miles N. E. of the first one. The westward one had its top covered with trees, and is from 60 to 80 feet high. Had several good observations, it being very clear at the time. Made them between 25 45 and 25 53 lat., and 131 10 and 131 32 E. lon. May 28, made a rock bearing E.; it was a list to the northward, and is about 140 feet high; we passed within two miles of it, and made it in 29 49 N. lat., 140 20 E. lon.

The black can buoys marking the port side of the Swash Channel, New-York bay, have been carried farther to the southward and westward, to mark the channel, as shown by the last survey, and are placed as follows:—

The entering buoy takes the position of the 2d class Nun Buoy on the outer end of the S. W. Spit. It is a 1st class Can Buoy, painted with red and black horizontal stripes, moored in 20 feet water, hard bottom, and marks the Main Ship Channel round the S. W. Spit also. Compass bearings: East Beacon, S. W.; Stone Beacon, N. W. by N.

Black Buoy No. 3, 2d class can, moored in 18 feet water, hard bottom. Stone Beacon, N. ¼ W.; Iron Beacon, E. N. E. ¾ E.

Black Buoy No. 5, 2d class can, moored in 18 feet water, hard bottom. Stone Beacon, E. by N.; Iron Beacon, E. by S.

By order of the Light House Board.

July 9, 1856.

The dredging of the bar at the mouth of the Chicago harbor has produced a ship channel, by the direct entrance, close to the north pier head, of ten feet deep by two hundred and fifty feet wide.—Vessels drawing full ten feet may enter as follows, viz:

Bring the north pier head to bear S. W. by W. and run for it until within one hundred feet or sixteen fathoms of it, taking care then to give it a berth of fifty feet, or, say eight fathoms. So soon as the beacon light on the north pier bears N. W. run into the river on a course W. by S.

Vessels may enter at night, as follows, viz: Bring the Light-House (not the beacon light on the north pier,) to bear, by compass, W. ½ S., and run on that course until the head of the south pier is passed. Then run up the river as usual.

If the wind be strong from the northward, then, in order to allow for lee way, and avoid the bar to the southward, run as follows, viz:

Bring the Light-House to bear W. ¾ S., and run for it, keeping on that course until the north-pier head is passed twenty fathoms. Then run for the middle of the river as per the chart.

By order of the Light House Board.

July 31, 1856.

On and after the 1st of May, 1856, a red revolving light has been shown from a six-sided iron light-house, built upon piles, near the south-eastern edge of the Gunfleet Sand, off the coast of Essex, in the East Swin, near the entrance of the Thames, which is 48 feet above mean sea level, and may be seen from the deck of a vessel from 7 to 8 miles. It stands with the following bearings, which are all magnetic, the variation being 21 deg. 15 min. W. Clackton Church, N. W. ½ W.; Walton Naze Tower, N. ¼ E.; Harwich High Light-house N. by E.; Sunk Light-vessel, E. ¾ S. 4½ miles.

HARBOR LIGHT, NANTUCKET.—The old apparatus has been removed from this light, and hereafter it will be illumined by an Argand Fountain Lamp and paraboloidal reflector, with a double ordinate of 21 inches.

OUR STATE ROOM.

Boat Armament of the U. S. Navy. By J. A. Dahlgren, Commander U. S. Navy. Second edition; King & Baird, Philadelphia.

This book is a happy sign of the times for our Navy. Four years have elapsed since a memorandum by the same author was printed by order of the Bureau of Ordnance, for the use of the officers of the Navy, in order to explain the system of Boat Armament, then recently adopted. That system, the memorandum of which was translated by Captain de Brettes of the Polytechnic School, Paris, where it has recently been published, showed Commander Dahlgren to be at the very head of his profession, in this branch of public service. The assiduity with which he has pursued his investigations and experiments, and the tests to which it has been submitted by others, have shown that the Boat Armament of the U. S. Navy is in a degree of efficiency and effectiveness, far surpassing this or any other age, and that in one thing at least, the subject of this book, our Navy is no longer in a condition which requires us to wait for the adoption of improvements by other Navies, before we apply them to our own. And we trust that the facilities which Commander Dahlgren's talent and industry have so ably earned, may speedily be extended to the attainment of the same degree of perfection in *ship* armament likewise; and to such ships too, as will have some adaptation to the probable necessities of small draught of water, in case of war.

Another Splendid Lithograph.—U. S. Mail Steam Ship *Baltic.* The admirers of this favorite ship will be glad to know that Menger, 12 Dey-street, N. Y., has published a fine lithograph of her, and if they would have a copy they must hurry.

New-York.—The *Supply* sailed on the 26th July, the *Release* on the 30th.

Captain F. Engle will command the *Wabash*, Commodore Paulding's flag-ship, in place of the Potomac, Captain Powell. Fleet surgeon Thos. Dillard has been detached, and fleet surgeon Rapalje ordered in his stead to the *Wabash.* Lieuts. J. S. Biddle and Edward Barrett, ordered to the *Wabash.*

16*th August.*—The *Merrimac* arrived, 52 hours from Boston, but had a strong head-wind all the way.

Washington.—Captain Duncan N. Ingraham has been appointed Chief of the Bureau of Ordnance and Hydrography.

Norfolk.—Lieut. P. W. Murphy has been detached from the Ordinary, and Commander W. C. Whittle ordered in his stead.

Philadelphia.—The *Minnesota*, on her trial-trip, is said to have performed satisfactorily to everybody on board, though no definite conclusions can be based upon it.

Boston.—The sloop-of-war *Cyane*, of the Home Squadron, arrived on the 9th ult.

The *Macedonian*, Captain John Pope, from China, arrived on the 6th ult. She came up the harbor under sail, and anchored off the Navy-yard about 6 o'clock. The Macedonian has been absent from the United States three years and three months in the East India and China Seas. She brings home for interment the remains of the late Commodore Joel Abbott, who died at Hong Kong, in December last. The following is a list of her officers:—*Captain*—John Pope; *Lieutenants*—W. Gwathmey, G. H. Preble, W. E. Boudinot; *Acting Lieutenant*—John Walters; *Acting Master*—J. G. Sproston; *Purser*—R. T. Allison; *Surgeon*—R. Woodworth; *Passed Assistant Surgeon*—J. S. Gilliam; *Captain's Clerk*—W. W. Whittlesey; *Boatswain*—John Hayden; *Carpenter*—Daniel Jones; *Sailmaker*—Charles Frost; *Acting Gunner*—Elliot.

Mediterranean.—The *Susquehanna* arrived at Gibraltar on the 23d ult., six days from Fayal, and sixteen from Key West. She was to leave in a few days for Spezzia, touching at some of the ports on the coast of Spain.

The *Constellation* sailed from Gibraltar, July 17, for Malaga. The Congress was at Gibraltar on 21st July.

Abstract of the Cruise of the U. S. steamer Saranac. The following is a summary of her cruise:

Whole distance sailed, 30,696 miles; countries visited, 15; ports entered, 118; revolutions made, 2,826,385; days in port, 792; days at sea, 176; days under steam, 176; days in quarantine, 11½; amount of coal consumed, 4,574¼ tons.

Pacific.—Lieut. Thos. G. Corbin has been detached from the Navy-yard, California, and ordered to the Sloop-of-war *John Adams*. The *Adams* sailed from San Francisco early in July.

The *Independence* was at Valparaiso Aug. 1st.

To Correspondents.—In our remarks on Navy-yard politics, a month ago, we were far from intending any such meaning as "Mechanic" complains of. We do not believe mechanics any more derelict in their duties than those who "superintend" what they are no judges of. But master workmen and quartermen are supposed to be judges, and *they*, certainly, cannot accuse us of unjust reflections when we couple them with the commandant—and the *superintendents*, whoever they are, whether officer or foreman, who fail to do their duty, even at the risk of detachment, for reporting idlers.

We are glad to receive contributions to our pages, and shall always give them respectful consideration, when accompanied with real name and address. If contributors prefer sailing under false colors, we have not the least objection, but we must have the name and address.

To our Patrons.—Having completed the fourth volume of the Magazine, through the progress of which we have been favored with the most cheering manifestations of public favor from the commencement of our enterprise, until the termination of the second year of its existence, with abundant assurance that the necessity of its farther extension and wider circulation is becoming more apparent every day, as the widening orbit of commercial and nautical interest open to the world, the proprietors have determined to give such encouragement for extending its circulation as shall be worthy of the attention of their friends, and will extend the following proposal for three months:

ICONOGRAPHIC CATALOGUE OF THE U. S. NAVAL LYCEUM, AT THE NAVY-YARD, BROOKLYN, N. Y.

Part III.

SECTION I.—FINE ARTS.

THE chief merit of this collection is the connection of fine *arts* with fine *subjects*. Washington, a bust by Greenhow, reveals the skill of the artist to an unusual degree—but it is all transformed into admiration of the subject; and as the beholder turns his eyes from this splendid bust, to the faithful portrait as President, which overhangs it, and thus contemplates the Great Man in two phases of his career, his mind reverts to an earlier age—and here, too, he finds him represented as a young Continental. To fill in the awakened train of thought, we see him again in tears of joy, on his first meeting his mother after the Revolution; and finally, in his farewell address. Besides these, he is a prominent picture in many groups, all arousing alike thoughts which no words have ever been able to convey—a due appreciation of Washington. One can hardly pass in review a collection of such pictures, without concluding that if all the powers of art were combined to represent a perfect man, it would result in being a Washington.

Here are portraits of Presidents—Washington, John Adams, Jefferson, Madison, Monroe, J. Q. Adams, Jackson and Van Buren. Secretary of the Navy, Badger. Commodores—Hull, Bainbridge, Chauncey, Nicholson, Decatur, Rodgers, Perry, Lawrence, Shaw, Downs, Turner, Bolton, Biddle, Commander Gerry; and a bust of Commodore Claxton. There are also, quite a large number of finely engraved portraits of distinguished naval and other personages, not usually found in galleries of art. Many of these portraits are by celebrated artists, from life; and there are few places where such a group of fine paintings, representing distinguished men, are to be found.

A miniature of John Paul Jones, taken from life, in France; presented to the Lyceum by his niece, Miss Janette Taylor, is probably the only genuine picture of this extraordinary individual extant. This miniature is justly esteemed and cared for by the Lyceum, as well for its genuineness as its subject. For of all naval heroes, Paul Jones has been oftenest caricatured, as well in purported miniatures and portraits, as in character; and it should be the pride of the Lyceum to vindicate the true character of naval heroes.

Miss Janette Taylor is the author of, or rather she furnished the authentic papers for the Life of Paul Jones, including his narrative of the campaign of the Liman, in the library of the Lyceum—which, though many of the same papers are republished in other of his biographies, is doubtless the best, for a true insight of his character, ever published. "By his will, dated

at Paris, on the day of his death, Paul Jones left his property and effects of all kinds to his sisters in Scotland and their children. Immediately on his decease an official inventory was made of his voluminous papers, which were sealed up with his other effects, till brought to Scotland by his eldest sister, Mrs. Taylor, a few months after his death. They have ever since remained in the custody of his family; and have now, by inheritance, become the property of his niece, Miss Taylor, of Dumfries."—(From the preface of Life of Paul Jones, giving account of materials, &c., published in Edinburgh, 1828). Miss Taylor came to this country in 1830. She generously placed the authentic materials in her possession, into the hands of a publisher, and the only true likeness of John Paul Jones she presented to the Lyceum.

It is much to be regretted that Mr. Badger's is the only portrait of the Secretaries of the Navy; and we trust that it is not yet too late to make known this fact, for the friends of the Lyceum to procure the much to be desired addition of all the Secretaries to its collection. Portraits of the Presidents, too, should be kept up in succession; and we hope soon to see this collection complete.

The original painting of the battle between the "Constitution" and the "Guerriere," is one of the next most to be prized in the collection; and besides these there is quite a large number of paintings and engravings of most of our celebrated naval battles.

An allegorical Belgian painting, by Gyerbrecht, more than two hundred years old, about four by six feet, representing the vanity of time, merits the study of an artist for a description. The emblems of death and immortality are prominently shown by a skull and head of wheat. Youthful indulgence unmistakably indicated by a cooler with flasks and glasses; while fame is represented by a flourishing trumpet. Philosophy first absorbs the attention of the aspirant, and he is surrounded by apparatus for the necessary attainments and practice of mathematics, drawing and painting. Next he receives his commission and is sent forth to labor. A book surrounded by straw, is the summary of his life—a memoir is all that is left!

A portrait from life, of the celebrated Negro chief, Abram, of the Seminole Indians, and several other portraits and miniatures of persons of *some*, though of less note than the above named, with a number of fine old landscapes, render it altogether an interesting gallery.

The U. S. S. Essex going round Cape Horn, commanded by Porter, 1813, is of remarkable merit, and probably unequalled by any painting of a ship at sea elsewhere to be found.

The gallant deeds of our truest and best patriots are so cherishing to the best interests of our nation, that no admissible occasion should ever be permitted to pass by without giving scope to the reflections which a single incident or memento arouses. The Essex, under Porter, was singularly unfortunate in not falling in with enemies on our coast, during the last war. In her anxiety

to encounter a foe, she finally got so out of the line of communication with the flag-ship of the squadron, that her commander came to the happy conclusion of making the best of his misfortune, by determining to act for himself, in a new field. On the 26th of January, 1813, the Essex left St. Catharine's for the Pacific Ocean. She encountered a most tempestuous passage, which this painting beautifully represents. She successfully weathers the storm; and to trace her further, developes the qualities which contribute most to develope the character of a great naval captain.

There are several volumes of fine engravings of the most celebrated works of art in the world; and also finely bound volumes of noted places and costumes in colors, of Russia, China, Turkey, and other places; and the life of Napoleon, exhibited by drawings of most of the famous exploits in which he figured.

There is great insufficiency of room in the Lyceum for the proper exhibition of this valuable collection of national paintings, and it is sincerely hoped that the Navy Department will extend the improvements of buildings on this station, to the appropriation of more room, for the use of this valuable Institution.

There are about three hundred casts of medallions of ancient heroes and statesmen, and twenty medals, commemorating distinguished deeds. These and about one thousand *ancient coins*, are worthy of much better display.

SECTION II.—NAVAL ARCHITECTURE, TACTICS, &c.

The following models of U. S. vessels of war are in the Lyceum:—Missouri and *Savannah,* (full rigged), *Ohio,* President, Hudson, *Saratoga,* Peacock, Somers, Levant, Argus, Enterprise, *Vincennes,* Fairfield, Washington, Spark, Albany, *Fulton* and Truxton; those in italics are still in the Navy. From this list the brig Truxton is selected, as one of the best of her class and time; for full description see another page. Besides these there are several fancy models of ships, steamers and boats.

Of Tactics.—The cases are replete with the implements of war of savage nations from every part of the world, and many of them show great ingenuity of workmanship, and are formidable.

The only objects under this head specially pertaining to the U. S., is a part of the chain which was made of wrought iron, and stretched across the North River from Fort Montgomery to the foot of Anthony's Nose, to prevent the British fleet from ascending to West Point in the time of the Revolution. There are a few trophies of war, such as bomb-shells, small brass pieces, &c., &c., and a good model of the Navy-yard dry dock.

CONCLUSION.

Since we commenced the publication of this catalogue, one year ago, the Lyceum has undergone material improvement, and it is now in a flourishing

condition. There are about *one hundred and fifty active members*, and there is scarcely a monthly meeting that does not increase the number. A complete catalogue of the books, now numbering near five thousand volumes, is in the hands of the printer, (this is the reason we discontinued the listin connection with the Iconographic sketches we have given), and will soon be ready for the members. A new edition of the Constitution and By-Laws has just been published.

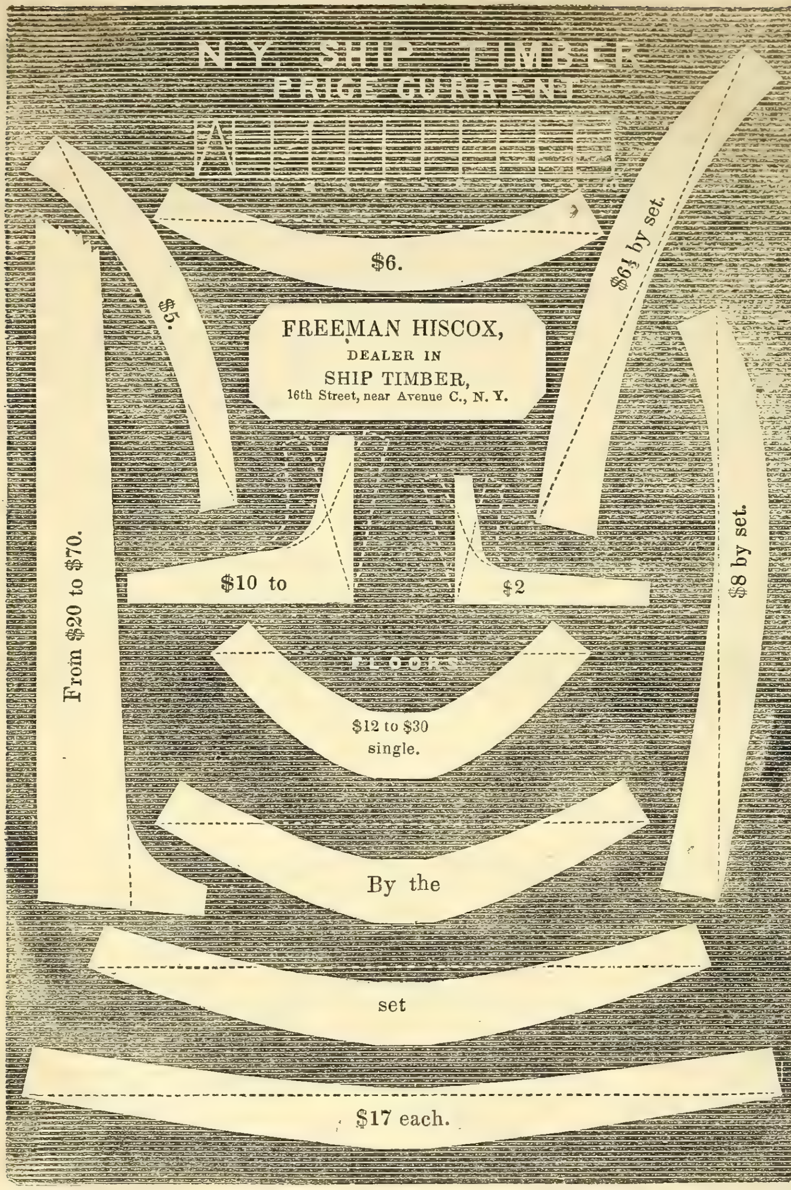
Chapter 1—"Of members," in the By-Laws, has been considerably amended, and some new sections added.

Sec. 6, is the most material alteration. "Any member of this Institution resigning from the service in good standing, although ceasing to be a member, shall, if so desiring, be considered a corresponding member." Previous to the passage of this By-Law, the Constitution had been so interpreted, that members of the Institution resigning from the service in good standing, were considered as retaining all the obligations and privileges of resident or absent members, as if still in the service.

The By-Laws are much more strictly enforced, and the whole property of the Lyceum better cared for, than for several years past; and it is to be hoped that the new impetus to improvement, now so palpable, will grow with the progress of the Institution, which is in every way worthy of the active interest of every officer in the Navy.

SHIP-BUILDING.

If there is one department of scientific knowledge more than another, which demands an investment of all the energies of the mind in the mechanical world, it is that of ship-building. In every other art the majesty of science holds out the sceptre of progress, and new achievements are the result; while in ship-building, traditional knowledge broods over the productions of philosophy, and the regal mandates of hereditary wisdom withholds the sceptre of improvement, setting bounds to the widening orbit of genius, beyond which it cannot pass.



A set floors and futtocks, $9 each. Oak Flitch, 30 cents per cubic foot; oak plank, $36⅔ to $40 per M; deck plank, $35 per M.; hackmatack timber, 25 cents per cubic foot; chestnut, ditto; cedar, 30 to 50 cents: yellow pine timber, rough, 35 to 45 cents per cubit foot; ditto, sawed, $28 to $30; yellow pine plank $27 to $30 per a

Oak Knees—5 inch $2 50; 6 inches, $5; 7 inches, $7; 8 inches, $10; 9 inches, $12; 10 inches, $15; above, $1 50 per inch.

Hackmatack Knees—5 inches, $1.50; 6 inches, $2 50; 7 inches, $4 25; 8 inches, $6 00; 9 inches, $8; 10 inches, $9 00; above, $1 per inch.